

COMPUTER SERVICES INDUSTRY, 1980 - 1985

ANNUAL REPORT FROM

THE MARKET ANALYSIS SERVICE

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I INTRODUCTION

I INTRODUCTION

- This report is produced by INPUT as part of the Market Analysis Service (MAS).
- The purpose of the report is to present forecasts and analyses of markets and developments in the computer services industry.
- These characteristics are described qualitatively, and their impact is reflected by computer services market size forecasts through 1985.
- The base year for forecasting is 1979. All forecasts are in current dollars.
- The impact of inflation on the computer services market forecasts is represented by the following assumed annual price increases through 1985.
 - Processing services, 6-7%.
 - Software products, 8-9%.
 - Professional services, 9-10%.
- This report provides information on each type of computer services category covered:
 - Processing services.

- . Function specific.
 - . Industry specific.
 - . Utility.
- Software products.
 - . Systems software.
 - . Applications software.
- Professional services.
 - . Services (EDP consulting, contract programming, systems design, etc.)
 - . Facilities management.
- It also addresses the modes of delivery of processing services:
 - Remote computing services.
 - Batch processing services.
 - Facilities management.
- Changes were made in aggregating both modes and types of service based on the results of INPUT's recent study, Trends in Delivery of Remote Computing Services. (See Appendix F.)
 - General business services and scientific and engineering services were replaced by a type of service called function specific. Function specific services relate to business or scientific and engineering func-

tions, such as accounting or surface design, that are used by many end users across industry sectors.

- Facilities management (FM) has been completely reevaluated and separated into "processing services facilities management" and "professional services facilities management." Processing services FM is performed on vendor-owned computers. Professional services FM involves the provision of people and expertise to operate a client-owned computer.
- Types and modes of services are forecast both separately and combined for each industry sector.
- The abbreviation AAGR used throughout this report stands for average annual growth rate.
- Analyses and forecasts are presented on each of the major industry sectors.
- The report contains a new section that briefly describes market opportunities in specialized markets of interest to clients. Selected markets in this report include:
 - Computer-assisted design and manufacturing (CAD/CAM).
 - Tax processing services.
 - General accounting services.
 - Payroll processing services.
- INPUT made a special effort this year to identify all companies that generated at least \$10M in available U.S. computer services revenue in their fiscal 1979. The results of that effort are:
 - A list of the largest computer services vendors serving the U.S.

- Market forecasts that can be tied to the survey that INPUT conducts for ADAPSO each year.
- Market forecasts that can be substantiated with company performance data segmented by computer service delivery mode.
- However, this report presents forecasts of "user expenditures," not "vendor revenues" as contained in the ADAPSO report.
- A historical perspective of the computer services industry's performance is shown in Appendix E. This perspective is based on the current 1980 definitions (listed in Appendix A) as well as market size adjustments that have been made in previous years.
- This Annual Report provides updates on information published in previous Annual Reports and other INPUT reports. A listing of these reports appears in Appendix F.
- The data on which this report is based come from:
 - Information from over 3,800 personal and telephone interviews INPUT staff have carried out during the past year with computer and computer services users.
 - Continuous interchange with vendors during the past year, including over 3,000 formal interviews.
- The results presented in this report derive from an analysis and interpretation of these data, based on the experience and expertise of INPUT staff.
- INPUT welcomes any inquiries or comments from clients on the information presented, as well as suggestions for changes in the structure or contents of this report.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. COMPUTER SERVICES MARKET SIZE AND GROWTH

- From 1970 to 1980 the U.S. computer services industry grew from \$3 billion to \$14 billion at an average annual growth rate of 16%. With higher annual inflation rates and increasing opportunities, INPUT projects the industry to grow even faster (20% average annual growth rate) over the next five years and to reach \$35 billion by 1985.
- The forecast for the U.S. computer services market through 1985 is shown in Exhibit II-1.
 - These figures include expenditures to obtain computer services from computer manufacturers.
 - Captive expenditures are excluded.
 - Classified federal government expenditures are also excluded.
- There are many areas in the industry that represent potential opportunities. Exhibit II-2 shows the magnitude of the opportunities based on incremental market growth through 1985.
- The importance of specialized products and services cannot be overemphasized. Over 80% of the growth in processing services will be of a specialized nature.

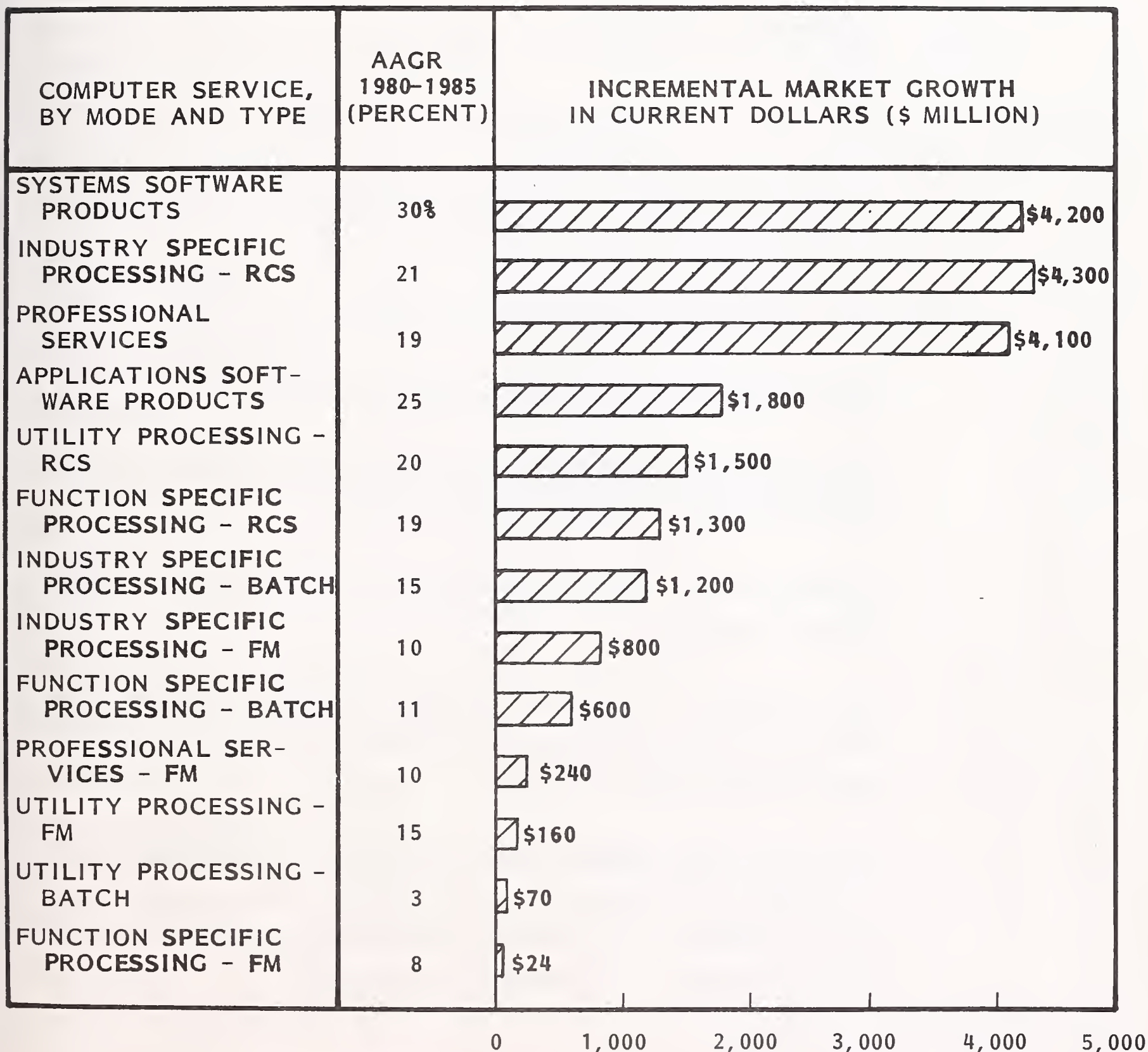
EXHIBIT II-1

COMPUTER SERVICES MARKET,
1979-1985

MODE OF DELIVERY	1979 (\$ BILLION)	1980 (\$ BILLION)	GROWTH 1979-1980 (PERCENT)	1985 (\$ BILLION)	AAGR 1980-1985 (PERCENT)
REMOTE COMPUTING SERVICES	\$ 3.5	\$ 4.3	21%	\$11.4	22%
FACILITIES MANAGEMENT	1.2	1.4	14	2.8	15
BATCH SERVICES	2.5	2.7	8	4.2	9
SUBTOTAL PROCESSING SERVICES	7.2	8.4	15%	18.4	17%
SOFTWARE PRODUCTS	1.9	2.4	28	8.4	29
PROFESSIONAL SERVICES	2.9	3.4	16	7.8	17
TOTAL	\$12.0	\$14.2	18%	\$34.6	20%

EXHIBIT II-2

INCREMENTAL MARKET GROWTH, BY MODE AND TYPE OF SERVICE, 1980-1985

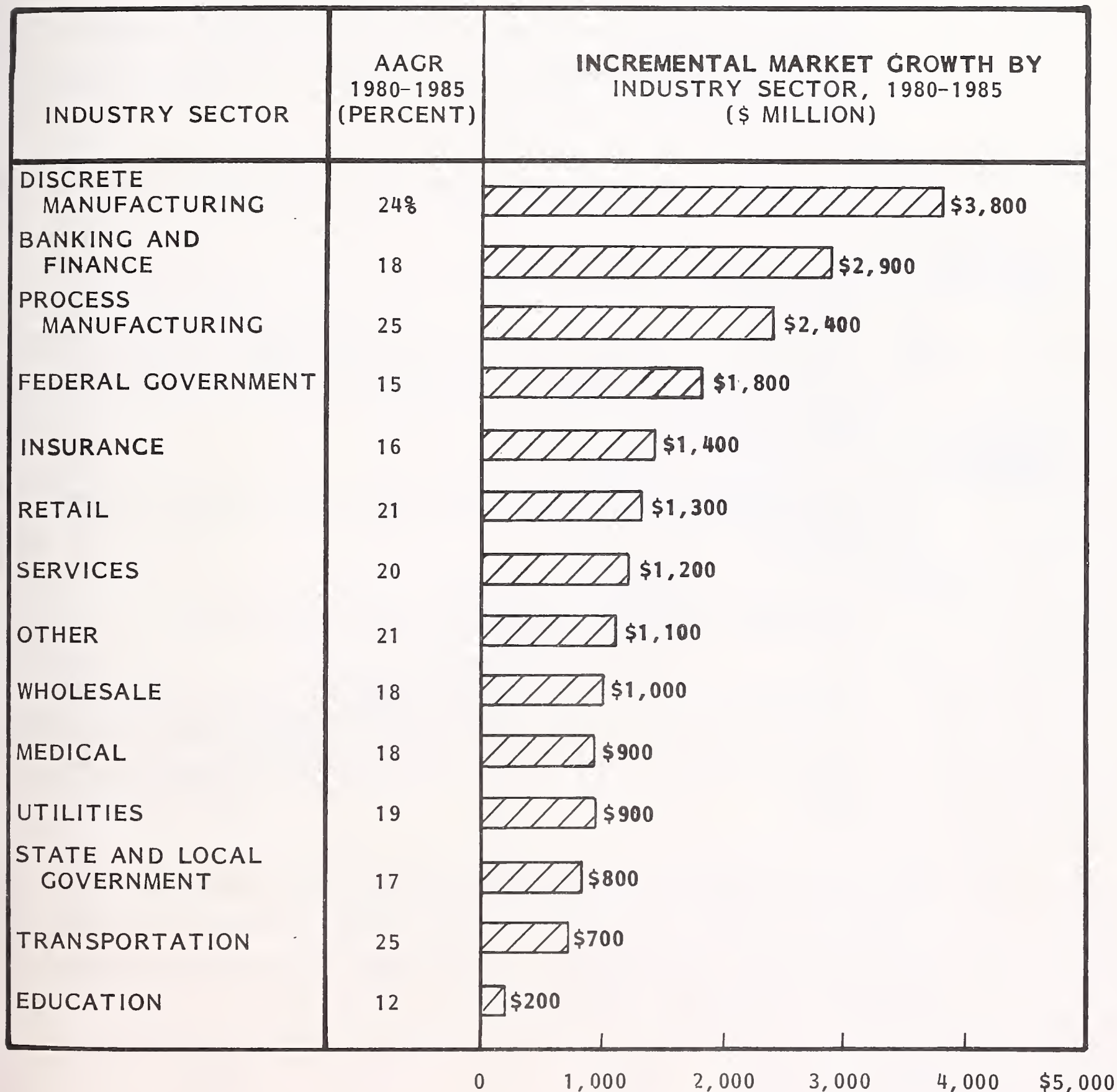


- Opportunity in the software product markets remains excellent. Even if computer manufacturers' involvement is discounted, these markets will increase by \$2,100 million between 1980 and 1985.
- As shown in Exhibit II-3, the discrete manufacturing industry sector provides the major set of opportunities for computer services. These opportunities result from:
 - A high level of on-line data base usage.
 - Systems and applications software product acceptance.
 - A significant amount of customized software development provided through professional services contracts.
- Factors that could accelerate market growth include:
 - Further software unbundling by the computer manufacturers.
 - Continued shortage of skilled in-house EDP personnel, which will create pressure for users to purchase computer services.
 - Creation and user acceptance of more on-line data bases than are presently forecast.
 - User demands for personnel and capital productivity improvements, which will favor computer services companies that can demonstrate these improvements.
 - More rapid user acceptance of processing services which are based on combinations of computers at the customers' sites, networks and central computers; e.g., components of products and services offered by computer services, user site hardware services, etc.

EXHIBIT II-3

INCREMENTAL MARKET GROWTH, BY INDUSTRY

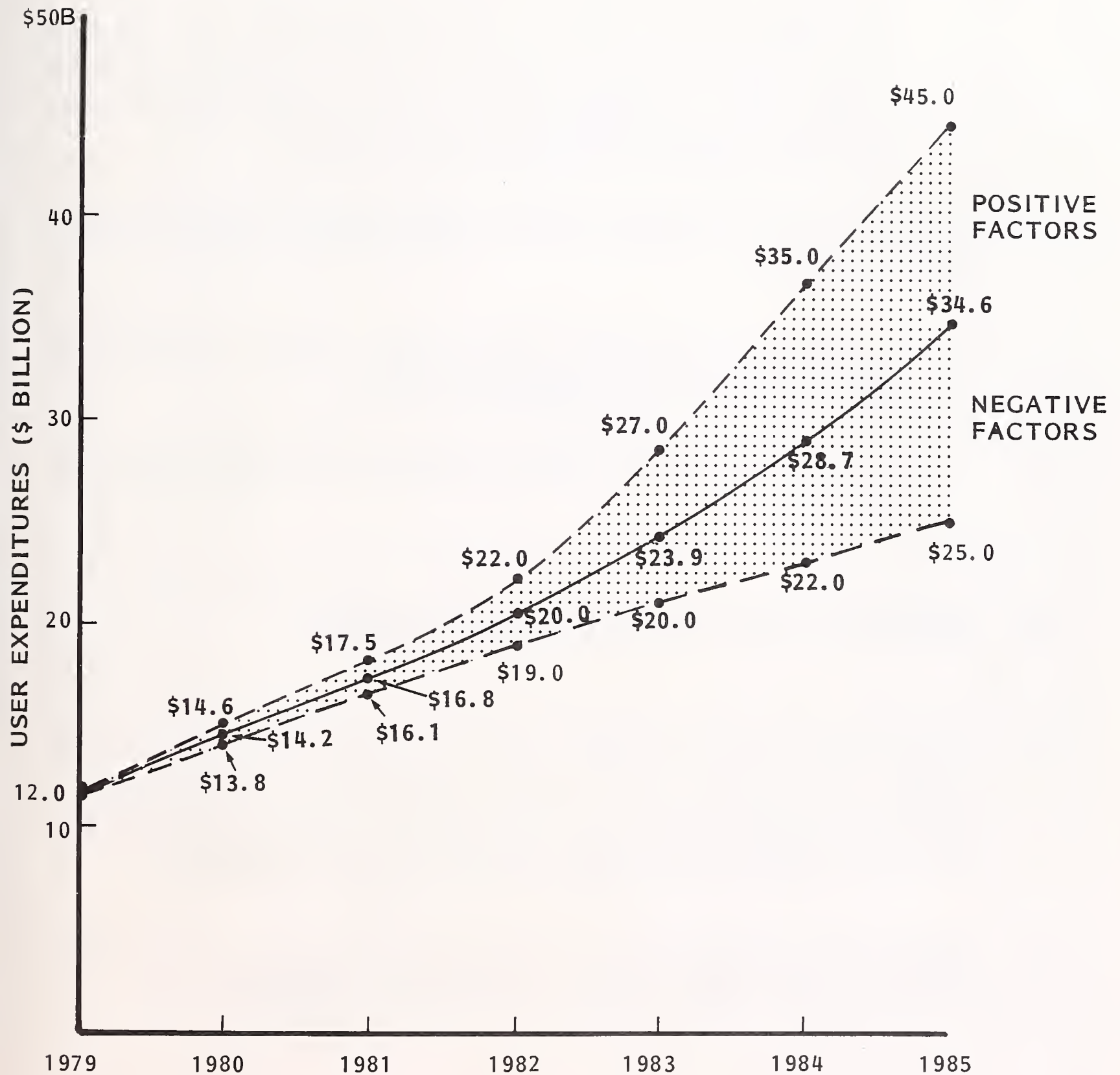
SECTOR, 1980-1985



- A major role in processing services for computer manufacturers, including IBM.
- A major role for telecommunications companies, including AT&T.
- Factors that could decelerate this market growth include:
 - Continued shortage and turnover of skilled personnel in computer services companies, leading to delays in product development and an inability to keep pace with market opportunities.
 - Conversion of interactive processing to in-house from RCS vendors.
 - Price competition between vendors.
 - Vendor delays in decision making on crucial new opportunities, such as on-line data base services, user-site hardware services and office-of-the-future services.
 - User acceptance of turnkey systems instead of computer services solutions.
 - Rebundling of software products by hardware manufacturers.
 - Proliferation of personal computers that will replace applications currently performed by RCS vendors, such as financial management and planning, without the RCS vendors' extending their services into new areas.
- The factors that may stimulate or limit growth could have substantial positive or negative impacts on the overall market by 1985, as Exhibit II-4 shows. INPUT considers it more probable that the market will exceed the forecast, than that it will fall short of the forecast.

EXHIBIT II-4

COMPUTER SERVICES INDUSTRY
FORECAST RANGE, 1979-1985



- The market for turnkey systems and applications machines continues to grow rapidly. It is a market very much parallel to that for computer services.
 - A major obstacle in market entry for computer services firms has been the poor profit performance of many turnkey vendors. Turnkey vendors that offer a generalized accounting-oriented turnkey system have not been successful.
 - The companies that have the best profit record are those that have highly specialized turnkey systems. Examples of successful specialized turnkey system companies include Applicon, CARS, Computervision, Reynolds & Reynolds, and Triad Computer Systems.
- Companies outside the computer industry are setting a high value on computer services companies.
 - It appears that the major 1979 acquisitions of Dun & Bradstreet and McGraw-Hill are just the beginning of a trend.
 - In 1980, Schlumberger, American Express and H&R Block made major acquisitions.

B. ISSUES AFFECTING COMPUTER SERVICES MARKETS

- Users indicate that they expect vendors to offer completely integrated systems in the future. It will no longer be desirable for a vendor to stress a single strong product or service. The user expects to purchase quality services that solve a complete problem (e.g., accounting) from a single vendor.
- Product/service specialization is becoming more and more important. Users perceive that specialized offerings are "better" than generic offerings.

- Productivity is both a problem and an opportunity.
 - It is a problem because the vendors must find ways to improve the productivity of their sales staff, support personnel, development people and management.
 - It is an opportunity because users need tools, techniques and approaches that will help them increase their personnel productivity.
- Computer hardware proliferation continues. More computer services companies than ever before are offering user site hardware services. As this occurs, and as computer manufacturers increase the software and services components of their sales, a blurring of the roles of vendors continues. The ultimate winners will be solution-oriented, specialized product/services vendors.
- There are new opportunities for computer services vendors to process message, image, voice and video data. Users want integrated networks. Therefore, offering just a data-only network will not be a long-term winning strategy.
- Processing is clearly becoming more distributed, and this trend is expected to persist through the decade.
- Proprietary data bases are an important key to new business opportunities. On-line data base usage is growing rapidly. The limits on growth appear to be imagination (new types of data bases), cost of on-line storage and the difficulties of automating very large sets of information. The advent and implementation of video disks will affect the storage cost problem, while imaging systems will impact the automation problem.
 - Publishers (e.g., The New York Times) and resource companies (e.g., Mead) are among the market-makers today. Indications are that these

companies expect to continue to add significantly to their successful data base activities.

- Transnational data bases also present a major opportunity to vendors that have international market coverage.
- The Western European computer services market was about 35% as large as the U.S. market in 1974, but has now increased to 60%. The gap in market size between the geographic areas will continue to close during the 1980s. The Western European market is behind the U.S. in processing services, but is moving ahead in some areas of telecommunications and consumer computing.
- Users continue to examine the cost/benefit analysis for in-house interactive computing. The trend continues for users to move interactive RCS in-house wherever possible.
- INPUT continues to expect IBM to provide computer processing services in the 1980s with "enhanced computer hardware" offerings.
- DEC, IBM and other computer manufacturers are expected to continue their systems and applications software development investments. These investments will soon begin to have a major impact in the application machine environment and potentially in the applications software product market.
- There is a trend for processing services vendors to attempt to obtain exclusive marketing rights for software and data bases offered on their network. Vendors perceive that they provide the competitive advantage in today's market. This is a marked departure from the historical industry approach of obtaining non-exclusive marketing rights for such products.

C. RECOMMENDATIONS

- Vendors must target account control as a near-term objective.
 - Account control should stress the continuing client relationship in all forms of computer services.
 - A complete product line should be available to a given type of user from a single vendor.
- Specialization by product, service and/or marketing capability is an essential ingredient to compete effectively in the marketplace. The specialization trend will continue through the 1980s.
- Computer services should be regarded as enhanced consulting services in many cases:
 - The computer is often not the important part of the offering.
 - The application capability and the people that identify and implement the solution are the keys to a vendor's success.
 - Emphasis should be placed on the customer support and consulting services available to the user.
- Vendors should begin tracking personnel productivity so that measurement of improvements is possible. This is true not only in development organizations, but also for sales staffs, support personnel and management.
- There is a market for productivity tools, techniques and approaches. Users and vendors alike will be positively inclined to participate in a program that is designed to increase productivity.

- Vendors of traditional financial management and analysis tools should closely examine the feasibility of switching their mode of delivery from RCS to personal computers. A recent INPUT study indicated that over 75% of large-company end users could have access to a personal computer by 1985.
- CAD/CAM and CAI have become important product/service opportunities. Vendors must rapidly determine what their position will be in these expanding markets.
- Vendors must identify the role the computer and office hardware will take in their future computer services offerings. Minicomputers and microcomputers have a role to play for vendors today, and that role will become more important over the next five years.
- As computer hardware proliferation continues for computer services firms, a field services strategy becomes essential. Field service can become a major profit contributor when the new forms of service are utilized, including:
 - Remote diagnostics.
 - Support centers.
 - Depot maintenance.
 - User self-maintenance.
- Vendors must prepare a response for users' movement to in-house "timesharing."
 - One solution uses a utility approach such as ADP, CSC and NCSS.
 - A second approach involves creating and selling users highly specialized solutions. This approach necessitates substantial front-end investment

to develop the applications, but promises high yields in the long term. GEISCO's approach to the market seems to fall in this category.

- As we move into the "information age" there is a magnificent opportunity for computer services companies to play leading roles as information vendors, information distributors and information processors. To do so they must involve themselves in office communications, management and technology innovations. They must also recognize that the pay-offs from such innovations may not appear for five to ten years.

III MARKET ANALYSIS 1980-1985

III MARKET ANALYSIS 1980-1985

A. COMPUTER SERVICES MARKET FORECAST METHODOLOGY

- Market forecasts presented in Exhibits III-1 and III-2 were derived from a "bottom-up" approach based on extensive evaluation of vendor revenues.
- Using 1979 as the base period, INPUT identified the computer services vendors with available U.S. revenues over \$10 million.
- Using information developed by INPUT's Company Analysis and Monitoring Program (CAMP) data base and other analyses, revenues for each company were broken down by mode of delivery.
- The CAMP data base was also sampled to develop average revenue breakdowns by type of vendor with available revenue under \$10 million.
- Applying average revenues by mode to the profile of vendors with revenues under \$10 million resulted in the 1979 estimates of vendor revenues. These were then translated to user expenditures.
- Growth rates for 1980 through 1985 are INPUT's best judgement based on:
 - Vendors' expectations, derived from over 3,000 interviews.

EXHIBIT III-1

COMPUTER SERVICES MARKET FORECAST BY
MODE AND TYPE OF SERVICE - TOTAL 1980-1985*

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNC. SPEC.	\$ 790	\$ 940	19%	\$1,120	\$1,340	\$1,580	\$1,890	\$2,270	19%
	IND. SPEC.	1,870	2,310	24	2,840	3,530	4,350	5,360	6,640	23
	UTILITY	870	1,020	18	1,220	1,460	1,760	2,100	2,540	20
SUBTOTAL		\$3,530	\$4,270	21%	\$5,180	\$6,330	\$7,690	\$9,350	\$11,450	22%
PROCESSING FACILITIES MANAGE- MENT	FUNC. SPEC.	50	50	8	60	60	70	70	80	8
	IND. SPEC.	1,040	1,180	14	1,360	1,560	1,790	2,060	2,380	15
	UTILITY	140	160	13	180	210	230	270	320	15
SUBTOTAL		\$1,230	\$1,390	14%	\$1,600	\$1,830	\$2,090	\$2,400	\$2,780	15%
BATCH	FUNC. SPEC.	810	890	10	990	1,110	1,230	1,400	1,530	11
	IND. SPEC.	1,240	1,350	9	1,480	1,620	1,800	1,930	2,140	10
	UTILITY	430	440	2	450	470	480	490	510	3
SUBTOTAL		\$2,480	\$2,680	8%	\$2,920	\$3,200	\$3,510	\$3,820	\$4,180	9%
TOTAL PROCES- SING	FUNC. SPEC.	1,650	1,880	14	2,170	2,510	2,880	3,360	3,880	15
	IND. SPEC.	4,150	4,840	17	5,680	6,710	7,920	9,350	11,160	18
	UTILITY	1,440	1,620	13	1,850	2,140	2,470	2,860	3,370	16
TOTAL PROCESSING		\$7,240	\$8,340	15%	\$9,700	\$11,360	\$13,280	\$15,570	\$18,410	17%
SOFTWARE PRODUCTS	SYSTEM	1,150	1,520	33	1,890	2,590	3,390	4,430	5,740	32
	APPLICATION	720	880	23	1,090	1,370	1,700	2,120	2,650	25
TOTAL SOFTWARE PRODUCTS		\$1,870	\$2,400	29%	\$3,080	\$3,960	\$5,090	\$6,550	\$8,390	29%
PROFES- SIONAL SERVICES	SERVICES	2,570	3,030	18	3,570	4,230	5,010	5,950	7,130	19
	FACILITIES MGMT.	370	400	7	440	480	530	580	640	10
TOTAL PROFESSIONAL SERVICES		\$2,940	\$3,430	16%	\$4,010	\$4,710	\$5,540	\$6,530	\$7,770	17%
TOTAL COMPUTER SERVICES		\$12,050	\$14,170	18%	\$16,790	\$20,030	\$23,910	\$28,650	\$34,570	20%

*USER EXPENDITURES ARE ROUNDED TO NEAREST \$10 MILLION

FUNC. SPEC. = FUNCTIONAL SPECIFIC, IND. SPEC. = INDUSTRY SPECIFIC

EXHIBIT III-2

**COMPUTER SERVICES - MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985***

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$1,710	\$2,080	22%	\$2,530	\$3,120	\$3,850	\$4,770	\$5,920	24%
PROCESS MANUFACTURING	1,010	1,250	24	1,530	1,900	2,370	2,980	3,680	25
TRANSPORTATION	290	350	22	430	540	670	840	1,070	25
UTILITIES	530	610	17	730	860	1,030	1,220	1,470	19
BANKING AND FINANCE	2,010	2,330	16	2,720	3,190	3,730	4,370	5,200	18
INSURANCE	1,130	1,290	15	1,480	1,710	1,970	2,280	2,660	16
MEDICAL	630	720	15	840	990	1,170	1,380	1,640	18
EDUCATION	250	280	12	300	340	380	420	480	12
RETAIL	690	810	19	970	1,170	1,410	1,700	2,070	21
WHOLESALE	620	720	15	840	990	1,160	1,390	1,670	18
FEDERAL GOVERNMENT	1,280	1,480	11	1,740	2,040	2,390	2,790	3,300	15
STATE AND LOCAL GOVERNMENT	590	680	16	790	930	1,090	1,270	1,490	17
SERVICES	700	830	19	990	1,190	1,430	1,710	2,080	20
OTHER	620	740	20	880	1,060	1,260	1,530	1,840	21
TOTAL	\$12,060	\$14,170	18%	\$16,770	\$20,030	\$23,910	\$28,650	\$34,570	20%

* USER EXPENDITURES ARE ROUNDED TO THE NEAREST \$10 MILLION

- 1980 User Panel data from over 900 EDP managers.
- User respondent data from over 3,800 telephone/on-site interviews in 1980.
- Both the forecast method and the establishment of new types of services delivery resulted in significant differences between INPUT's market forecasts generated in 1979 and those generated this year. Reconciliation of differences is detailed in Appendix C.

B. EXPECTED IMPACT OF INFLATION

- All expenditures forecasts are in current dollars. The figures include price increases due to expected inflation. Price increases due to inflation have been tied to the expected production price index (PPI).
 - For processing services, a 7% rate was included for 1980. The PPI is expected to fall to 6% in 1981, rise again to 7% in 1982, return to 6% for 1983-1984, and rise to 7% by 1985.
 - For software products, which are more labor-intensive, an 8% rate was included for 1980-1981, going to 9% in 1982, returning to 8% for 1983-1984, and rising to 9% again in 1985.
 - For professional services, the most labor-intensive, a 9% rate was forecast for 1980-1981, rising to 10% in 1982, returning to 9% in 1983-1984, and rising to 10% again in 1985.
- Price increases for the 1980-1982 timeframe are consistent with vendor and user expenditures found in INPUT's study, Trends in Computer Services Pricing. (See Appendix F.)

C. FUNCTION SPECIFIC PROCESSING SERVICES

- Function specific processing services are dominated by payroll and general accounting services.
- Growth for the forecast period (at 15% AAGR, the lowest of processing types) is impacted by the growing presence of mini/micro systems, and to a degree by market saturation.
- Reaching down to smaller companies with its "mini service," ADP continues to expand its batch payroll service nationwide, with annual company growth exceeding 20% in payroll services. There may have been some "flattening" this year due to the recession.
- Using applications based on Itel's Business Services, CSC is expanding service offerings in accounts receivable, payable, payroll and general ledger to middle-market companies.
- McAUTO introduced its Engineering Accounting Service, which handles both project status and financial control for middle-market companies. The project system includes labor distribution and job cost accounting integrated with financial control, which includes accounts receivable, accounts payable and general ledger.
- In another rapidly expanding area, cash management, ADP offered "Communicash," a deposit-reporting and concentration service developed in conjunction with Crocker National Bank.
- National Data Corporation has interfaced its network with GEISCO's Mark III service to offer a cash management service, including timesharing, telecommunications, data exchange and customized reporting, to both banks and corporate users.

D. INDUSTRY SPECIFIC PROCESSING SERVICES

- Banking and finance industries will remain the largest individual sector, with user expenditures representing nearly 30% of the total in 1985, as shown in Exhibit III-3.
- In what may be known as "The Year of the ATM," the number of installed automatic teller units doubled in 1980 from the previous installed base.
 - Tymshare Transaction Services expanded its ATM services in western states through its EFT switch operated by its subsidiary, Tymshare Funds Transfer Service.
 - Decimus, the DP subsidiary of Bank of America, has initially offered ATM processing services to over 100 banks in California and has plans to offer services nationwide.
 - The Exchange, a shared user ATM network covering Oregon and Washington, supports ATMs from 33 banks and savings and loans.
- "NOW" account processing is becoming more prevalent as savings and loans nationwide offer interest-paying checking accounts.
 - "NOW" account processing by FHLBs is being challenged by both bank and commercial computer processors, opening the market up to widespread competition.
- Spurred by expanding market opportunities resulting from trucking industry deregulation, McAUTO's Freight application couples rail and truck route and rate information with an on-line system for freight quotes, charges, orders, bills of lading and invoices.

EXHIBIT III-3

INDUSTRY SPECIFIC PROCESSING SERVICES - MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 337	\$ 418	24%	\$ 519	\$ 652	\$ 801	\$1,002	\$ 1,236	24%
PROCESS MANUFACTURING	168	204	21	247	297	395	438	541	22
TRANSPORTATION	90	105	16	125	149	177	210	250	19
UTILITIES	82	98	19	118	143	174	214	260	22
BANKING AND FINANCE	1,245	1,450	16	1,690	1,980	2,330	2,730	3,260	18
INSURANCE	563	635	13	726	828	940	1,075	1,235	14
MEDICAL	405	461	14	525	609	701	816	944	15
EDUCATION	48	54	13	61	69	78	89	101	13
RETAIL	350	407	16	472	260	659	78	934	18
WHOLESALE	165	186	13	210	241	278	315	369	15
FEDERAL GOVERNMENT	25	30	20	37	45	55	67	82	22
STATE AND LOCAL GOVERNMENT	33	39	18	48	59	69	84	102	21
SERVICES	390	461	18	552	668	799	966	1,178	21
OTHER	244	290	19	342	409	479	567	679	19
TOTAL	\$4,145	\$4,838	17%	\$5,672	\$6,709	\$7,935	\$9,354	\$11,171	18%

- Xerox Computer Services is a leader in integrated RCS services for manufacturers, with nearly 30% of its revenues derived from its interactive accounting system. Offerings include order entry, invoicing, inventory control, accounts receivable, material requirements planning and cost planning and control.

E. UTILITY PROCESSING SERVICES

- Exhibit III-4 shows that the market for utility processing services will experience moderate growth through 1985.
- Entering the consumer market with Micro Net, CompuServe, Inc. is offering information retrieval and utility processing services using Tandy Corporation's TRS-80 personal computers.
- With the installation of its Cray-1 computer and expansion of its UNINET Services, United Computing Services (UCS) expanded its utility services offerings to major manufacturing and engineering organizations in more than 225 major metropolitan areas.
- With a rapidly expanding market for graphics services, Tymshare is offering FOCUS to produce high-resolution bar graphics, pie charts, curves and histograms in full color. This is a market which Comshare is also aggressively pursuing with powerful distributed processing systems.
- A specialist in office automation services through remote computing, Bowne Information Systems, with the "Bowne Connection," provides network compatibility among a wide variety of word processing, facsimile and photocomposition systems, coupled with abstracting, cataloging and publishing services.
- Entering the expanding field of disaster recovery services, Martin-Marietta's REBOUND offering guarantees restoration within four hours of an event, using regular transfer to off-site storage, use of data center resources, and a

EXHIBIT III-4

**UTILITY PROCESSING SERVICES - MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985**

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 160	\$ 182	13%	\$ 205	\$ 236	\$ 271	\$ 309	\$ 359	15%
PROCESS MANUFACTURING	215	252	17	300	358	431	515	619	20
TRANSPORTATION	30	33	10	36	39	45	47	53	10
UTILITIES	131	144	10	159	175	195	219	241	11
BANKING AND FINANCE	55	61	11	69	80	89	101	114	13
INSURANCE	30	33	10	36	40	44	48	52	9
MEDICAL	17	18	6	20	22	24	27	30	11
EDUCATION	37	39	5	40	42	44	46	49	5
RETAIL	60	66	10	72	81	91	102	117	12
WHOLESALE	122	129	6	135	144	151	161	174	6
FEDERAL GOVERNMENT	328	375	14	451	538	643	768	948	25
STATE AND LOCAL GOVERNMENT	99	109	10	120	133	148	164	184	11
SERVICES	70	83	19	98	120	145	175	210	20
OTHER	85	98	15	112	129	151	177	209	16
TOTAL	\$1,439	\$1,622	13%	\$1,853	\$2,137	\$2,474	\$2,859	\$3,359	16%

communications network. Long-term backup is accomplished by transfer to IBM computers located in Martin-Marietta disaster recovery areas.

F. SOFTWARE PRODUCTS

- With a 28% AAGR over the forecast period, as shown in Exhibit III-5, software products continue to be the most rapidly growing segment of the computer services market.
- Currently the smallest computer services industry segment, software products will grow from 16% of total expenditures in 1980 to nearly 24% by 1985.
- Software product growth will come from a variety of factors:
 - Continued unbundling by the mainframe vendors, particularly IBM.
 - Increasing shortage of in-house programming personnel.
 - User recognition of the cost effectiveness of buying software products.
 - Rapid growth in the number of delivered minicomputers.
 - Change due to government regulation in selected industries, such as banking and finance, and transportation, requiring major revision and enhancement of applications software packages.
 - Increasing trend toward transaction-driven systems, requiring development of new systems and applications software packages.
 - Shift toward data base orientation for company information systems, requiring expanded use of data base management and support systems.

EXHIBIT III-5

SOFTWARE PRODUCTS - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 390	\$ 510	31%	\$ 660	\$ 870	\$1,135	\$1,490	\$1,930	31%
PROCESS MANUFACTURING	200	272	36	369	490	660	885	1,175	35
TRANSPORTATION	66	90	36	122	165	227	305	415	36
UTILITIES	70	91	30	117	156	201	258	340	30
BANKING AND FINANCE	260	310	19	375	450	545	660	810	22
INSURANCE	210	255	21	310	380	460	560	695	22
MEDICAL	70	95	36	130	176	240	315	415	34
EDUCATION	45	52	16	60	68	75	87	100	15
RETAIL	75	102	36	139	190	255	340	445	34
WHOLESALE	90	122	36	166	225	300	410	540	35
FEDERAL GOVERNMENT	205	266	30	337	418	519	641	772	25
STATE AND LOCAL GOVERNMENT	92	109	18	129	157	185	224	264	19
SERVICES	54	69	28	88	114	145	185	240	28
OTHER	45	61	36	80	107	141	190	245	33
TOTAL	\$1,872	\$2,404	28%	\$3,082	\$3,966	\$5,088	\$6,550	\$8,386	28%

I. SYSTEMS SOFTWARE PACKAGES

- Expenditures for systems software packages represent 63% of the total 1980 software products market. They continue to rise more rapidly than those for purchase/lease of application packages, as shown in Exhibit III-6.
- Continued rapid growth is attributed to a combination of continued unbundling and average annual price increases exceeding 10%, related primarily to package maintenance fees.
- Systems software vendors have large and ongoing financial relationships with users, with nearly 40% of total revenues coming from rental, installment and maintenance, as opposed to outright purchase.
- Computer manufacturers dominate the systems software marketplace, with close to 50% of total 1980 revenues.
 - IBM has over 30% of the total 1980 market.
 - Minicomputer vendors currently have a 10%, but increasing, market share.
- Further details on systems software are found in two INPUT reports: Opportunities in Marketing Systems Software Products and Trends in Computer Services Pricing. (See Appendix F.)

2. APPLICATIONS SOFTWARE MARKETS

- With total expenditures exceeding \$2.5 billion by 1985, the applications software market, as shown in Exhibit III-7, has growth rates exceeding 30% in four industry sectors: process manufacturing, transportation, medical and retail.

EXHIBIT III-6

**SYSTEMS SOFTWARE PACKAGES - MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985**

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 280	\$ 370	32%	\$ 480	\$ 630	\$ 830	\$1,090	\$1,420	31%
PROCESS MANUFACTURING	160	220	38	300	400	540	730	970	35
TRANSPORTATION	46	63	36	85	115	160	215	290	36
UTILITIES	55	73	32	95	130	170	220	295	32
BANKING AND FINANCE	70	90	29	120	150	200	260	340	30
INSURANCE	80	105	31	140	180	230	300	390	30
MEDICAL	35	49	40	69	95	130	175	235	37
EDUCATION	30	35	17	41	47	51	60	70	16
RETAIL	40	55	38	75	100	140	190	250	36
WHOLESALE	35	49	40	69	95	130	180	240	37
FEDERAL GOVERNMENT	200	260	30	330	410	510	630	760	25
STATE AND LOCAL GOVERNMENT	77	92	20	110	135	160	195	230	20
SERVICES	25	33	31	43	57	74	95	125	30
OTHER	19	27	42	36	49	66	90	120	35
TOTAL	\$1,152	\$1,521	32%	\$1,993	\$2,593	\$3,391	\$4,430	\$5,735	30%

EXHIBIT III-7

APPLICATIONS SOFTWARE PACKAGES - MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$110	\$140	29%	\$ 180	\$ 240	\$ 305	\$ 400	\$ 510	29%
PROCESS MANUFACTURING	40	52	31	69	90	120	155	205	32
TRANSPORTATION	20	27	35	37	50	67	90	125	36
UTILITIES	15	18	20	22	26	31	38	45	20
BANKING AND FINANCE	190	220	16	255	300	345	400	470	16
INSURANCE	130	150	15	170	200	230	260	305	15
MEDICAL	35	46	32	61	81	110	140	180	31
EDUCATION	15	17	12	19	21	24	27	30	12
RETAIL	35	47	35	64	90	115	150	195	33
WHOLESALE	55	73	33	97	130	170	230	300	33
FEDERAL GOVERNMENT	5	6	20	7	8	9	11	12	15
STATE AND LOCAL GOVERNMENT	15	17	14	19	22	25	29	34	15
SERVICES	29	36	25	45	57	71	90	115	26
OTHER	26	34	30	44	58	75	100	125	30
TOTAL	\$720	\$883	23%	\$1,089	\$1,373	\$1,697	\$2,120	\$2,651	25%

- The rapid proliferation of applications software products is highlighted in INPUT's recently completed study on Opportunities in Marketing Applications Software Products.
- Market forces are beginning to lean toward consolidation - a relatively small number of large vendors are emerging to dominate heavily penetrated functions and industries.
- The applications software market is still primarily for IBM or IBM plug compatible computers.
 - Over 60% of total 1980 expenditures were for IBM architectures.
 - Nearly 17% of the software product market was minicomputer-based, including those of DEC, Data General and Hewlett-Packard.
- Computer manufacturers continue to be a significant, but not dominant, factor in the applications software marketplace, holding a declining 22% of the 1980 market.

G. PROFESSIONAL SERVICES MARKET

- Operating from a revised 1979 base of nearly \$3 billion, as shown in Exhibit III-8, the professional services market will experience sustained growth of 17% AAGR over the forecast period.
- Escalating personnel costs driven by inflation continue to force companies to consider automation of information processes. Lacking sufficient internal capability, companies will seek outside professional help.
- Improvements in technology afford automation possibilities formerly not feasible, let alone economic, widening areas of professional services offerings.

EXHIBIT III-8

PROFESSIONAL SERVICES - TOTAL MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 495	\$ 605	22%	\$ 735	\$ 905	\$1,120	\$1,385	\$1,730	23%
PROCESS MANUFACTURING	270	325	20	385	465	560	670	810	20
TRANSPORTATION	65	83	27	105	135	170	215	280	28
UTILITIES	150	176	17	207	238	284	331	393	17
BANKING AND FINANCE	259	277	15	331	386	440	511	587	15
INSURANCE	240	270	12	300	337	384	426	480	12
MEDICAL	105	112	7	121	131	137	147	163	8
EDUCATION	85	95	12	105	120	135	150	170	12
RETAIL	115	135	19	165	195	230	275	330	20
WHOLESALE	95	112	18	133	158	184	219	260	18
FEDERAL GOVERNMENT	580	650	12	740	840	940	1,060	1,210	13
STATE AND LOCAL GOVERNMENT	330	386	17	452	533	624	731	863	17
SERVICES	25	30	18	35	41	49	58	69	18
OTHER	127	155	22	190	230	280	350	425	22
TOTAL	\$2,932	\$3,422	16%	\$4,004	\$4,714	\$5,537	\$6,528	\$7,770	17%

- In INPUT's recent study, Trends in Computer Services Pricing, vendor and user analyses indicated that professional services growth will come from increased business volume and price increases greater than those for other computer services. (See Appendix F.)

I. STANDARD PROFESSIONAL SERVICES

- Covering custom consulting, programming, education and training, as shown in Exhibit III-9, standard professional services represent over 80% of the total professional services market.
- Boeing Computer Services (BCS) participates in the EDP educational services market, estimated at \$640 million in 1979 in INPUT's report Opportunities in Educational Services. (See Appendix F.) BCS has expanded its education and training division with the opening of a national training center using HP 3000 computers for CAI.
- With over 70% of its \$15 million in 1979 revenues related to professional services, AGS develops such custom systems as:
 - An IMS data base system for N.Y. Telephone to handle customer inquiry, update and delete and to handle customer additions.
 - A satellite monitoring service for Holmes Protection Inc., using 16 IBM Series/1 minicomputers in a DDP configuration.
- With nearly 70% of 1979's \$11 million in revenues derived from professional services, Computer Task Group Inc. serves primarily Fortune 500 companies, specializing in the areas of banking, manufacturing and criminal justice systems.
- DASD, with \$18 million in 1979 revenues, specializes in program conversion, including DOS to OS, any COBOL to any other COBOL, and ALC to ANS COBOL.

EXHIBIT III-9

STANDARD PROFESSIONAL SERVICES -
MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 490	\$ 600	22%	\$ 730	\$ 900	\$1,115	\$1,380	\$1,725	24%
PROCESS MANUFACTURING	265	320	20	380	460	555	665	805	20
TRANSPORTATION	65	83	27	105	135	170	215	280	28.
UTILITIES	145	170	17	200	230	275	320	380	17
BANKING AND FINANCE	230	265	15	305	355	405	470	540	15
INSURANCE	200	225	12	250	280	320	355	400	12
MEDICAL	100	107	7	115	125	130	140	155	8
EDUCATION	85	95	12	105	120	135	150	170	12
RETAIL	115	135	19	165	195	230	275	330	20
WHOLESALE	93	110	18	130	155	180	215	255	18
FEDERAL GOVERNMENT	300	350	16	410	480	550	640	750	16
STATE AND LOCAL GOVERNMENT	325	380	17	445	525	615	720	850	17
SERVICES	25	30	18	35	41	49	58	69	18
OTHER	127	155	22	190	230	280	350	425	22
TOTAL	\$2,565	\$3,025	18%	\$3,565	\$4,231	\$5,009	\$5,953	\$7,134	19%

- Science Application Inc., a leader in software quality assurance, offers both programming and educational professional services to government agencies.
- SDC entered the energy field with a professional services support contract with Unified Industries Inc. for support of the Alaskan Natural Gas System.
- Systems and Computer Technology Corporation has focused a significant part of its professional services activities on state and local governments and educational institutions. Long-term professional services contracts are:
 - Design and implementation of the Financial Information and Resources System for Los Angeles County.
 - Design and implementation of Court Law Enforcement and Management Information Systems.
 - Design and implementation of SCT's Integrated Student Information System for MIT.

2. PROFESSIONAL SERVICES FACILITIES MANAGEMENT

- Professional services facilities management contracts are, as shown in Exhibit III-10, primarily related to the federal government.
- Moderate growth (10% AAGR) over the forecast period could significantly increase if the new administration accelerates military programs.
- Still strong in the federal marketplace, CSC added to its professional facilities management contracts in 1979:
 - Design and engineering for computers and communications for the Naval Air Test Center.

EXHIBIT III-10

**PROFESSIONAL SERVICES FACILITIES MANAGEMENT -
MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985**

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 5	\$ 5	-	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	-
PROCESS MANUFACTURING	5	5	-	5	5	5	5	5	-
TRANSPORTATION	*	*	-	*	*	*	*	*	-
UTILITIES	5	6	17%	7	8	9	11	13	16%
BANKING AND FINANCE	20	23	15	26	31	35	41	47	15
INSURANCE	40	45	12	50	57	64	71	80	12
MEDICAL	5	5	7	6	6	7	7	8	10
EDUCATION	*	*	-	*	*	*	*	*	-
RETAIL	*	*	-	*	*	*	*	*	-
WHOLESALE	2	2	15	3	3	4	4	5	20
FEDERAL GOVERNMENT	280	300	6	330	360	390	420	460	9
STATE AND LOCAL GOVERNMENT	5	6	20	7	8	9	11	13	17
SERVICES	*	*	-	*	*	*	*	*	-
OTHER	*	*	-	*	*	*	*	*	-
TOTAL	\$367	\$397	7%	\$439	\$483	\$528	\$575	\$636	10%

* BECAUSE THIS INDUSTRY SECTOR IS PROJECTED TO HAVE LESS THAN \$5 MILLION IN 1985 USER EXPENDITURES, IT HAS NOT BEEN SEPARATELY FORECAST.



- Support of the calibration laboratory at the USAF Arnold Engineering Development Center.
- Planning Research Corporation, in conjunction with Culpepper Associates, developed and operates CALMA, a disaster relief information system, using the GTE Telenet packet-switching network for the Federal Emergency Management Agency (FEMA).
- Computer Data Systems Inc., with nearly 70% of revenues related to professional services, has major contracts for:
 - MIS services to DOE for energy data collection and reporting.
 - Operation of the National Alcoholism Program Information System for NIH.

H. VENDOR ACTIVITY ACROSS INDUSTRY SECTORS

I. USER SITE HARDWARE SERVICES (USHS)

- In a continued shift of RCS services from vendor to user sites, INPUT forecasted in its study, Market Opportunities for User Site Hardware Services from RCS Companies, that user expenditures of \$120 million in 1980 will grow to exceed \$1.6 billion in 1985, a 55% AAGR.
 - USHS will represent 14% of total 1985 RCS expenditures.
 - Industry specific applications dominate, with 59% of total 1985 USHS expenditures.
- Vendors adopting the USHS strategy gain the following competitive advantages:

- Participation in the distributed data processing market.
 - Participation in corporate plans for decentralization without loss of control.
 - Integrated computer, network and software services, available from no other source.
 - Entry into the small user marketplace, whether in a large or small enterprise.
- Announcement of the IBM 4300 series required adjustment in USHS plans, though the tempo of these announcements increased. In addition to initial vendors of USHS, (ADP, GEISCO and NCSS), other vendors have entered the market.
- CSC has a distributed data processing offering, Infostation, using PDP 11/23 and PDP 11/44 processors coupled with CSC's proprietary DBMS system, MANAGE.
 - On-Line Systems, Inc. is marketing its Outline/I system using Datapoint 1500/1800 intelligent terminals. Besides data entry, OLS offers OASES, a securities data base system, FMS for financial planning and the OLIVER DBMS with the Outline/I service.
 - SEI, Inc. offers its TrustAid system, using Prime minicomputer systems, to bank trust departments. Distributed functions thus far include remote data entry and edit, storage and printing.
 - Xerox Computer Services has installed over 100 model 1350 intelligent terminals, consisting of a Diablo 3200 microcomputer with a communications port. The DDP system can handle a cluster of four terminal workstations.

- Tymshare's DDP offering, the Tymshare Model 1100/1105 intelligent terminal system, is initially oriented as a source data entry and edit system, but can also be used to access and execute system network product offerings.
- Informatics' Data Service Division has a DDP offering to wholesale distributors on Honeywell Level 6 minicomputers, including on-line order processing and inquiry.

2. DATA BASE SERVICES

- Combining data and delivery tools to supply information to meet a voracious demand for information, the market for data base services, \$1.2 billion in 1979, will grow at a 24% AAGR over the next five years.
 - The on-line portion represents less than 12% of total 1979 data base expenditures.
- Data base ownership, either direct or through license, is a key to the services markets.
 - Over 400 data bases are currently available on-line.
 - Over 140 vendors create and maintain data bases.
 - Over 60 RCS vendors offer on-line data base services.
- Four industry sectors govern 65% of total 1979 expenditures:
 - Banking and finance - \$270 million, mainly from securities and commodities, financial and economic, and credit data base usage.
 - Manufacturing - \$200 million, from nearly all on-line data base types.

- Services - \$135 million, from legal, accounting and credit data base usage.
- Retail - \$130 million, mainly from credit data base usage.
- User expenditures exceed \$100 million in four of 14 types of data bases:
 - Credit - \$240 million.
 - Securities and commodities - \$140 million.
 - Financial and economic - \$125 million.
 - Marketing - \$105 million.
- RCS revenues for data base services represent 25% of total 1979 RCS revenues.
- RCS vendors experience significant "pull-through" revenues for data base services. These "pull-through" revenues are included in the forecast.
 - Depending on the type of data bases and proprietary service offered, "pull-through" revenues range between \$3-8, with an average of \$6 in RCS revenues for each \$1 of data base subscription services revenue.
- Vertical integration by major publishers, expansion of major distribution vendors such as GTE, entry of news vendors, foreign competition and the emergence of consumer networks will dramatically alter the marketplace in the 1980s. Distinctions will vanish between information sources, information access and information delivery as electronic technology matures.
- Accelerated market expansion will come from wideband communications, imaging systems, low-cost consumer terminals and integrated office automation.

- The costs of information storage, access and delivery will continue to decrease with the increasing use and availability of new electronic technology.

IV OPPORTUNITIES IN SPECIALIZED MARKETS

IV OPPORTUNITIES IN SPECIALIZED MARKETS

A. INTRODUCTION

- INPUT has added a new section to this year's annual report that briefly describes several specialized markets that are of interest to clients.
- This year's topics include:
 - Computer-assisted design and manufacturing (CAD/CAM).
 - Tax processing services.
 - General accounting processing services.
 - Payroll processing services.

B. COMPUTER-ASSISTED DESIGN AND MANUFACTURING (CAD/CAM)

I. CAD/CAM DEFINITION

- In the broadest sense, CAD/CAM could describe all of those products and services which utilize computer technology within the engineering design/

manufacturing process. These could range from very large scientific computers to numerically controlled machine tools and industrial robots.

- This report covers those computer-based systems, products and services used in repetitive engineering design activities which provide the capability of manipulating data in graphical form.

2. APPLICATIONS

- The applications performed by CAD/CAM systems cover a broad spectrum of manufacturing and design activities. Exhibit IV-1 lists typical applications performed by today's systems.

3. MARKET SIZE

- It is estimated that the 1979 revenues of CAD/CAM services and products were \$300 million. The market will grow between 30% and 50% annually during the next five years as CAD/CAM is more fully integrated as a production tool within industry.
 - Approximately 75% of the CAD/CAM market today is controlled by turnkey systems vendors.
 - Computer services revenues will grow approximately 30% per year for the next five years, while turnkey systems will grow at nearly 50% per year.
- The mechanical applications will show the greatest growth during the next five years as their potential customer base is much larger than the other market segments'.
- At present the mechanical segment is the least penetrated market.

EXHIBIT IV-1

CAD/CAM APPLICATIONS IN 1979

MECHANICAL ENGINEERING

- N/C TAPE GENERATION.
- AUTOMATED DRAFTING.
- VEHICLE DESIGN.
- STRESS ANALYSIS.
- THREE-D VIEWING SYSTEMS.
- THREE-D MODELING.
- BILL OF MATERIALS.

CIVIL/STRUCTURAL ENGINEERING

- PIPING LAYOUT.
- ARCHITECTURAL DESIGN.
- PLANT LAYOUT.
- LARGE STRUCTURE DESIGN (e.g., BUILDINGS, BRIDGES, ETC.).
- POWER GRID LAYOUT/ANALYSIS.

ELECTRONIC ENGINEERING

- PRINTED CIRCUIT BOARD DESIGN AND LAYOUT.
- INTEGRATED CIRCUIT DESIGN (SYSTEM PARTITIONING, LOGIC SIMULATION AND CIRCUIT SIMULATION).
- INTEGRATED CIRCUIT LAYOUT (DRAWING COMPOSITES AND DIGITIZING).
- INTEGRATED CIRCUIT DESIGN VERIFICATION (DESIGN RULE CHECKING, ELECTRICAL SCHEMATIC GENERATION AND INTERCONNECTION VALIDATION).
- AUXILLIARY DESIGN AIDS (TEST VECTOR OPTIMIZATION, RELIABILITY FORECASTING AND DATA MANAGEMENT).

MAPPING AND OTHER

- MUNICIPAL MAPPING.
- UTILITY SYSTEM LAYOUT (e.g., WATER, POWER, SEWAGE, GAS AND TRANSPORTATION).
- TERRAIN MAPPING.
- EARTH RESOURCE MONITORING.
- MINERAL EXPLORATIONS.
- PETROLEUM EXPLORATIONS.

4. MARKET PARTICIPANTS

- The present CAD/CAM market includes six turnkey system vendors, as shown in Exhibit IV-2.
- These six vendors accounted for approximately 80% of all revenues for standalone turnkey CAD/CAM systems for 1979.
- Major computer services vendors include Adage, Evans & Sutherland, IBM, Lockheed, McAUTO, MDSI, CDC and UIS.

5. DRIVING FORCES

- The large forecasted growth of the CAD/CAM market is being driven by the increasing demand for productivity improvements within the manufacturing segments of industry. One advantage offered by CAD/CAM systems is a reduction in the design phase of product development. This allows a more rapid market entry with new products than is possible using manual design procedures.
- In typical mechanical design applications, a 2:1 productivity gain associated with CAD/CAM is not unusual. Productivity gains of eight to ten times have been reported.
 - Methods of evaluating productivity gains associated with CAD/CAM are typically not standardized, however, and thus are subject to a certain amount of skepticism.
 - For example, productivity gains in mechanical design have been measured in drawings per hour, designs per hour, labor cost per design hour and labor cost per drawing. The use of different techniques to measure productivity gains makes comparison between gains difficult, but does not diminish the actual increase in productivity obtained from the use of the CAD/CAM system.

EXHIBIT IV-2

MAJOR CAD/CAM TURNKEY SYSTEM VENDORS IN 1979

COMPANY	FISCAL 1979 WORLDWIDE REVENUES (\$ MILLION)
COMPUTERVISION	\$103
GERBER SCIENTIFIC	45
APPLICON	28
AUTO-TROL	34
CALMA (UNITED INFORMATION SYSTEMS)	33
M&S COMPUTING	30

- Nonetheless, there have been no reports of any decreases in productivity, and thus the question is not whether CAD/CAM improves productivity, but how much improvement it offers.
- Integration of CAD/CAM technology will create an additional demand on the already overburdened software development industry. Since CAD/CAM is a software-intensive activity, the limits on its growth are far more related to software availability than to hardware limitations.
- Computational limitations of the present mini-based turnkey systems will create opportunities for computer services organizations to provide networking of individual systems, thereby creating a balance between centralized and distributed processing. Thus the present standalone turnkey systems could become de facto intelligent peripherals as the need to off-load computationally laden activities to a host computer becomes more pronounced.
- Remote processing services for interactive graphics have been limited in the past because of the relatively slow transmission rates of telephone lines. The introduction of digital data service, with line rates of as high as 56K baud has made remote computing services a more realistic option for consideration by potential users of CAD/CAM technology.
- Additional driving forces will include:
 - Energy efficiency requirements.
 - VLSI complexity.
 - Metal removal requirements for automobile manufacture.
 - Automatic routing for printed circuit boards.

C. TAX PROCESSING SERVICES

I. GENERAL DESCRIPTION OF SERVICE

- Processing services companies offer tax processing services for corporate, partnership and individual tax returns.
- The customer is usually a CPA firm or another tax preparer, as opposed to the taxpayer.
- The final product typically includes:
 - Three copies of the return.
 - Often laser printed on official forms.
 - Federal schedules provided for state returns.
 - Letter of instructions to taxpayer.
 - Labels.
 - Mailing envelope to tax collector.
 - Bill to taxpayer.

2. MARKET SIZE, STRUCTURE, DRIVING FORCES

- INPUT forecasts the 1980 processing services market for tax preparation at \$170 million.
- Three firms dominate the market, with 65% of total revenues:

- Computax.
- Tymshare.
- Fastax.
- INPUT forecasts an average annual growth rate of 13% for this market, which will reach \$320 million in 1985.
 - This growth rate is relatively low, reflecting the saturation of processing services provided to this segment.
- The driving forces behind the existence and expected growth of this market, as shown in Exhibit IV-3, are primarily accuracy and quality.
- Accuracy is achieved with:
 - Manual and computerized audits made at various stages of the process.
 - Preprinted forms.
- Quality is achieved as follows:
 - Comparisons are made with previous years' returns and, for deductions, with national averages.
 - Previous years' returns are assessed for:
 - Income-averaging possibility.
 - Net operating loss carry forward.
 - Capital loss carry forward.

EXHIBIT IV-3

FACTORS IMPACTING THE MARKET FOR TAX PREPARATION SERVICES, AS REPORTED BY MAJOR COMPETITORS

FACTORS	RATING*
QUALITY	5
ACCURACY	5
SPEED	4
EASE/USE/CUSTOMER SERVICE	4
EXTENSION PRODUCT FEATURES	3.5
LOW PRICE	3
DISTRIBUTED PROCESSING CAPABILITY	3
AVAILABILITY OF PRODUCT IN MANY CITIES	3
INTEGRATION WITH OTHER PRODUCTS	2.5

*RATED ON A SCALE OF 1 TO 5, WITH 5 HAVING THE MOST IMPACT

- State tax refunds.
- Different depreciation methods are examined.
- Speed:
 - Pick-up and delivery services are offered in major cities.
 - Twenty-four hour turnaround is available.
 - Partial data is accepted, so when final data is available, the return may be immediately processed.
 - Major processing services firms have night shifts available for the peak loads inherent in tax processing.
- Ease of use:
 - Preprinted forms facilitate data preparation for submittal.
 - Most vendors offer free workshops, training and manuals to tax preparer clients.
 - Hot-line service available.
 - Technical advice available.
- Convenience:
 - Proformas are supplied. Proformas are partially filled-out input sheets, using previous years' data.
 - Reruns are provided (at reduced cost or free - early in the tax season) as new information becomes available or incorrect data are discovered.

- Free storage is offered for partially completed returns.

3. COMPETITION

- Major competitors with 65% of the market are Computax, Fastax and Tymshare, with its Unitax and Dynatax offerings. These firms do federal and all state returns.
- Other significant competitors, such as Computer Sciences Corporation and Comshare, are expanding the number of state returns offered.

4. FUTURE ISSUES

- Inherent in tax preparation software are complexity and constant change. These conditions favor processing services over application packages or turnkey systems.
- Major processing services providers point to:
 - Clients' desire for interactive processing.
 - Distributed processing.
 - Home computers processing individual data. H&R Block's acquisition of CompuServe could be a significant factor.

D. GENERAL ACCOUNTING SERVICES

I. GENERAL DESCRIPTION OF SERVICE

- General accounting services include processing of:

- General ledger.
 - Accounts payable.
 - Accounts receivable.
 - Job costing.
 - Sales analysis.
 - Financial reporting.
 - Labor distribution.
 - Personnel reporting.
- Processing services firms offer general accounting services using various delivery modes:
 - Interactive computing.
 - Remote batch.
 - Batch processing.
 - A number of RCS firms offer user site hardware services to their clients.

2. DRIVING FORCES IN THE MARKET AND MARKET FORECAST

- The major driving force in the market is the availability of the service in many cities. Vendors have found that extensive networks are a requirement to support their large customers.

- Another major driving force is the need to keep the service price low. There are many alternatives to processing services (e.g., manual procedures, turnkey systems, in-house operated software products, etc.), which keep the market highly competitive.
- INPUT has found that processing services vendors do not attempt to cost justify the service to their clients. Instead of tangible benefits, the vendor sells intangibles:
 - Knowledge of business people's needs.
 - Timeliness.
 - Quality and accuracy.
 - Convenience.
- Much of the growth in general accounting revenue in processing services is from first-time users.
- The market for general accounting processing services will grow 15% a year, from a 1980 base of \$400 million to \$800 million by 1985.

3. FUTURE ISSUES

- Lower computer hardware costs are the central issue impacting the general accounting processing services market. As the price/performance of in-house systems improves, more companies utilize that solution at the expense of processing services firms.
- Retaining the larger customer is a key vendor concern. User site hardware services are one successful approach to serve the larger customer. An INPUT study, Market Opportunities for User Site Hardware Services from Remote Computing Services Companies, summarized the benefits of this approach:

- Significantly lower costs.
 - Retained access to services firm's software.
 - Users' ability to do applications development on user site.
 - Availability to the user of the RCS firm's network.
 - Continued support.
- Processing services firms interviewed universally view the smaller customer as a major factor in their market. Addressing this market successfully will require:
 - A wide range of software alternatives for users.
 - The support typically required by first-time users.
 - Alternative methods of distribution besides batch processing.

E. PAYROLL PROCESSING SERVICES

I. DESCRIPTION

- Payroll processing services firms provide some or all of the following services to their customers:
 - Calculations regarding earnings, taxes and deductions.
 - Tax reports for federal, state and local governments.
 - Payments to government tax collectors.

- Labor distribution and job cost report.
- Some firms integrate the payroll service with other offerings such as general ledger or personnel reporting.
- Data are usually transmitted to the processing services vendor on preprinted forms.
 - Phone input via voice or touch-tone is being offered for smaller firms (usually fewer than 50 employees). This is especially true where there are few changes from payroll to payroll.
 - Larger firms are submitting data via magnetic tape.
- Output, in the shape of paychecks, tax returns and reports for internal and government use, are usually on paper, though some larger firms receive magnetic tape for output.

2. DRIVING FORCES AND MARKET FORECAST

- The availability of the service in many cities is a strong driving force in the market.
- Product features rate heavily in the user's decision to select a processing services vendor.
- Vendors view a variety of factors as significant in the user justification process:
 - Cost reduction and avoidance.
 - Accuracy.
 - Tax law knowledge.

- Convenience.
 - Confidentiality.
 - Tax payment prompting.
 - Reporting flexibility and capability.
- Many vendors, but particularly banks, see the payroll service as a key element in expanding their market for other services.
 - Banks view the preparation of the paycheck as a small part of a much larger offering relating to both processing services and banking services. The banking services could include management of profit sharing, pensions and other employee benefits.
 - Because payrolls occur with such frequency, the cost of transportation of input data and output in the form of checks and reports is significant and rising.
 - The market for payroll processing services is \$600 million in 1980. This market segment will grow 17% a year to become \$1.3 billion by 1985.

3. SERVICES

- The use of computerized payroll processing services is shown in Exhibit IV-4.
- A wide variety of services are offered in the payroll processing area. The basic service normally consists of:
 - Paycheck preparation.
 - Payroll-related tax returns for federal, state and local governments.
 - Impounding funds and actually filing returns.

EXHIBIT IV-4

**METHOD OF PAYROLL PREPARATION
BY COMPANY SIZE**

COMPANY REVENUE SIZE (\$ MILLIONS)	PERCENT OF COMPANIES USING THIS METHOD			TOTAL PERCENT
	MANUAL	IN-HOUSE	SERVICES	
LARGE >\$150M	0%	70%	30%	100%
MEDIUM \$5-150M	15	44	41	100%
SMALL <\$5M	77	5	18	100%

- As companies grow, more services are used:
 - Labor distribution.
 - Vacation/sick pay accounting.
 - Insurance reports.
- Some firms offer powerful report writers (e.g. ADP, Bank of America, SBC) which allow the customer to create customized reports. These vendors generally also offer customized reporting from the general ledger, receivables and payables subsystems as well. In addition, a personnel data base is generally available for interrogation to supply required information for:
 - EEOC and other government agencies.
 - Union requirements.
 - Management needs.

4. COMPETITION

- There is competition for payroll processing among a variety of vendors using a variety of solutions.
- On a national level, ADP is the major competitor. In California, where branch banking exists, the Bank of America is the major supplier of payroll services.
 - The Bank of America's many branches facilitate pickup and delivery in all areas of the state.
 - Since customers of a bank often look first to their own bank for payroll services, the major banks with systems in place have an initial advantage.

- As companies change banks, they can also change payroll processors, giving some banks a significant turnover of accounts.
- The competitive situation could change with the advent of national banking. Major banks could then offer their service on a nationwide basis, providing a powerful service to multilocation companies and access to other users on a greatly expanded basis.
- Users have the alternatives of acquiring an applications package or doing the payroll in-house.
- The processing services firms interviewed gave the following reasons why their customers did not use an in-house or a turnkey system solution:
 - "Cost efficiency."
 - "Problems of maintenance, because of the constant changes of government regulations, federal and multistates."
 - "Better uses for the computer."
 - "Give someone else the payroll problem."
 - "Wants service."
 - "Keep payroll outside for confidentiality reasons."
 - "Tax service."

5. FUTURE ISSUES

- Processing services firms are examining the role that technology can play in processing payrolls.

- Data input by end users via intelligent terminals is one obvious way that new, low-cost technology may be employed.
- Data output via the end user's intelligent terminal is also a possibility.
- Interactive remote computing is another delivery mode being evaluated.
- Payroll processing services vendors are also examining the user need for additional applications related to payroll. Such applications include:
 - General ledger and its connection to payroll.
 - Personnel data base systems.

V COMPETITION

V COMPETITION

A. THE INPUT DIRECTORY

- For the first time, INPUT is publishing the INPUT Directory of the largest vendors of computer services in the U.S., as shown in Exhibit V-1.
 - The companies are ranked by their available U.S. computer services revenues for fiscal year 1979.
 - The data are INPUT estimates, since most of the companies do not release this information to the public.
 - The data have been rounded to the nearest million dollars.
 - All of the companies had computer services revenues exceeding \$10 million per year.
- No single vendor dominates the computer services industry.
 - The largest vendor, IBM, has only 9% of the INPUT Directory's revenue and 4% of the total industry's user expenditures.
 - Twelve of the companies had computer services revenues of \$100 million or greater, and they represented 46% of the INPUT Directory's revenues.

EXHIBIT V-1

THE INPUT DIRECTORY OF THE LARGEST VENDORS OF

COMPUTER SERVICES IN THE U.S. IN 1979

RANK	COMPANY	COMPUTER SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)	PROCESSING SERVICES REVENUE		SOFTWARE PRODUCTS REVENUE		PROFESSIONAL SERVICES REVENUE	
			\$M	RANK	\$M	RANK	\$M	RANK
1	IBM	\$525	-	-	\$425	1	\$100	3
2	CDC	470	350	1	70	2	50	8
3	CSC	320	90	7	-	-	230	1
4	ADP	260	255	2	-	-	5	50
5	EDS	235	170	4	5	28	60	7
6	GEISCO	195	190	3	-	-	5	50
7	SDC	159	14	60	-	-	145	2
8	TYMSHARE	157	149	5	4	30	4	55
9	MCAUTO	125	105	6	4	30	16	21
9	NCR	125	80	10	35	5	10	36
11	BRADFORD NATIONAL	120	76	11	-	-	44	10
12	ARTHUR ANDERSEN	100	-	-	8	26	92	5
13	MITRE	99	-	-	-	-	99	4
14	PRC	96	27	35	-	-	69	6
15	INFORMATICS	95	37	27	25	8	33	12
16	NCSS	87	84	8	3	36	-	-
17	BCS	86	62	14	9	22	15	24
18	UNITED INFO SYSTEMS	85	82	9	3	36	-	-
19	SHARED MEDICAL SYSTEMS	70	70	12	-	-	-	-
19	BANK OF AMERICA	70	70	12	-	-	-	-
19	BURROUGHS	70	-	-	50	3	20	16
22	TRW	62	62	14	-	-	-	-
23	HONEYWELL	60	-	-	40	4	20	16
24	CHASE MANHATTAN BANK	59	53	16	2	40	4	55
25	MARTIN MARIETTA	53	30	32	4	30	19	18

EXHIBIT V-1 (CONT.)

THE INPUT DIRECTORY OF THE LARGEST VENDORS OF
COMPUTER SERVICES IN THE U.S. IN 1979

RANK	COMPANY	COMPUTER SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)	PROCESSING SERVICES REVENUE		SOFTWARE PRODUCTS REVENUE		PROFESSIONAL SERVICES REVENUE	
			\$M	RANK	\$M	RANK	\$M	RANK
26	XEROX COMPUTER SERVICES	\$51	\$48	20	\$ 3	36	-	-
27	FIRST DATA RESOURCES	50	50	17	-	-	-	-
27	NATIONAL DATA CORP.	50	50	17	-	-	-	-
29	CCH COMPUTAX	49	49	19	-	-	-	-
30	EQUIFAX	47	47	21	-	-	-	-
30	SYSTEMS CONSULTANTS	47	-	-	-	-	\$47	9
32	REYNOLDS AND REYNOLDS	45	45	22	-	-	-	-
33	QUOTRON	43	43	23	-	-	-	-
34	TRANS UNION	42	42	24	-	-	-	-
35	AMERICAN MANAGEMENT	41	16	57	-	-	25	14
36	A.C. NIELSEN	40	40	25	-	-	-	-
36	BUNKER RAMO	40	40	25	-	-	-	-
36	DRI	40	24	38	-	-	16	21
36	DEC	40	-	-	35	5	5	50
40	UCC	38	19	47	19	11	-	-
41	ANACOMP	36	29	34	5	28	2	60
41	COMSHARE	36	36	28	-	-	-	-
43	SYSTEMS AND COMPUTER TECH.	35	-	-	-	-	35	11
44	NATIONAL SHAREDATA	33	33	29	-	-	-	-
45	TELECREDIT	32	32	30	-	-	-	-
46	OSI	31	31	31	-	-	-	-
47	ARTHUR D. LITTLE	30	5	83	-	-	25	14
47	MGMT. SCIENCE AMERICA	30	-	-	30	7	-	-
47	SCIENCE APPLICATIONS	30	-	-	-	-	30	13
47	STATISTICAL TABULATING	30	30	32	-	-	-	-

EXHIBIT V-1 (CONT.)

THE INPUT DIRECTORY OF THE LARGEST VENDORS OF
COMPUTER SERVICES IN THE U.S. IN 1979

RANK	COMPANY	COMPUTER SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)	PROCESSING SERVICES REVENUE		SOFTWARE PRODUCTS REVENUE		PROFESSIONAL SERVICES REVENUE	
			\$M	RANK	\$M	RANK	\$M	RANK
47	SPERRY UNIVAC	\$30	-	-	\$20	9	\$10	35
52	SUN INFORMATION SERVICES	26	\$19	47	1	43	6	49
53	ADVO	25	25	36	-	-	-	-
53	OHIO COOP LIBRARY	25	25	36	-	-	-	-
53	HEWLETT-PACKARD	25	-	-	20	9	5	50
56	MDSI	23	22	40	1	43	-	-
56	SYSTEMATICS	23	23	39	-	-	-	-
56	DIGICON	23	22	40	1	43	-	-
59	MEAD CORP.	22	20	44	1	43	1	64
59	AGENCY RECORDS CONTROL	22	22	40	-	-	-	-
61	COMNET	21	21	43	-	-	-	-
62	MEDICUS SYSTEMS	20	6	80	6	27	8	47
62	NLT COMPUTER SERVICES	20	20	44	-	-	-	-
62	NY TIMES INFO. BANK	20	20	44	-	-	-	-
62	TECHNICON MEDICAL INFO. SYS.	20	11	66	2	40	7	48
62	RAPIDATA	20	17	54	-	-	3	58
67	LOGICON	19	-	-	-	-	19	18
67	CARS	19	19	47	-	-	-	-
67	COMPUSERVE	19	19	47	-	-	-	-
67	SCIENCE MANAGEMENT	19	-	-	4	30	15	24
71	CITIBANK	18	18	51	-	-	-	-
71	LAMBDA TECHNOLOGY	18	-	-	-	-	18	20
71	SEI	18	18	51	-	-	-	-
71	DOW JONES	18	18	51	-	-	-	-
71	FINANCIAL INDUSTRY SYS.	18	-	-	4	30	14	27

THE INPUT DIRECTORY OF THE LARGEST VENDORS OF

COMPUTER SERVICES IN THE U.S. IN 1979

RANK	COMPANY	COMPUTER SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)	PROCESSING SERVICES REVENUE		SOFTWARE PRODUCTS REVENUE		PROFESSIONAL SERVICES REVENUE	
			\$M	RANK	\$M	RANK	\$M	RANK
78	U.S. DATACORP	\$17	\$17	54	-	-	-	-
78	STANDARD AND POORS	17	17	54	-	-	-	-
78	C.A.C.I.	17	-	-	\$ 1	43	\$16	21
79	STSC	16	15	59	-	-	1	64
79	FLORIDA SOFTWARE SERVICES	16	4	86	16	-	-	-
79	LOCKHEED	16	10	71	30	-	2	60
79	TELECHECK	16	16	57	-	-	-	-
79	KEANE ASSOCIATES	16	5	83	43	-	10	36
84	LITTON MELLONICS	15	5	83	-	-	10	36
84	DASD	15	-	-	1	43	14	27
84	DATA GENERAL	15	-	-	15	12	-	-
84	TEXAS INSTRUMENTS	15	-	-	15	12	-	-
84	CALCULON	15	-	-	-	-	15	24
84	INSURANCE SYS. OF AMERICA	15	1	91	16	-	2	60
90	COMPUTER TASK GROUP	14	2	89	-	-	12	30
90	APPLIED INFO. DEVELOPMENT	14	-	-	1	43	13	29
90	ADR	14	-	-	11	19	3	58
90	PANSOPHIC SYSTEMS	14	-	-	14	14	-	-
90	THE COMPUTER COMPANY	14	12	62	-	-	2	60
95	CINCOM SYSTEMS	13	-	-	12	16	1	64
95	KEYDATA	13	13	61	-	-	-	-
95	INFORMATION SCIENCE	13	4	86	22	-	-	-
95	RAND INFORMATION SYSTEMS	13	3	88	-	-	10	36
95	SOFTWARE AG OF NA	13	-	-	13	15	-	-
100	BOOZ ALLEN AND HAMILTON	12	-	-	-	-	12	30

EXHIBIT V-1 (CONT.)

THE INPUT DIRECTORY OF THE LARGEST VENDORS OF
COMPUTER SERVICES IN THE U.S. IN 1979

RANK	COMPANY	COMPUTER SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)	PROCESSING SERVICES REVENUE		SOFTWARE PRODUCTS REVENUE		PROFESSIONAL SERVICES REVENUE	
			\$M	RANK	\$M	RANK	\$M	RANK
100	INTERNATIONAL COMPUTAPRINT	\$12	\$12	62	-	-	-	-
100	AGS COMPUTERS	12	-	-	-	-	\$12	30
100	ANALYSTS INTERNATIONAL	12	-	-	-	-	12	30
100	ASSOCIATED PRESS	12	12	62	-	-	-	-
100	DIAL COMPUTER SYSTEMS	12	11	66	-	-	1	64
100	FINANCIAL DATA SYSTEMS	12	11	66	43	-	-	-
100	INTERMETRICS	12	-	-	2	40	10	36
100	SOFTWARE DESIGN ASSOC.	12	-	-	3	36	9	45
100	DATACROWN	12	12	62	-	-	-	-
100	BOWNE INFO SYSTEMS	12	11	66	1	43	-	-
111	ADVANCED COMPUTER TECH.	11	6	80	1	43	4	55
111	CUTLER WILLIAMS	11	-	-	-	-	11	34
111	SAFEGUARD BUSINESS SYS.	11	11	66	-	-	-	-
111	SOFTWARE INTERNATIONAL	11	-	-	11	19	-	-
111	AMHERST ASSOCIATES	11	6	80	-	-	5	50
111	SEIBELS BRUCE AND CO.	11	2	89	9	22	-	-
111	SYSTEMS & PROGRAMMING RES.	11	-	-	-	-	11	34
118	TELOS COMPUTING	10	-	-	-	-	10	36
118	DATA COMMUNICATIONS	10	9	76	1	43	1	64
118	INFO. SYSTEMS DESIGN	10	8	78	1	43	1	64
118	PENTAMATION ENTERPRISES	10	8	78	1	43	1	64
118	BOLT BERANEK & NEWMAN	10	-	-	-	-	10	36
118	COMPUTER SHARING SERVICE	10	10	71	-	-	-	-
118	EASTERN AIRLINES	10	10	71	-	-	-	-
118	IMPERIAL COMPUTER	10	9	76	-	-	1	64

THE INPUT DIRECTORY OF THE LARGEST VENDORS OF COMPUTER SERVICES IN THE U.S. IN 1979

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- Only five of the companies with revenues over \$100 million, CDC, EDS, McAuto, NCR and Tymshare, provided all three delivery modes of computer services.
- Acquisitions in 1980 reflected the continuing trends of large, non-computer services firms entering the computer services industry through acquisitions and established computer services firms taking the same route to expand into vertical industry-specialized markets.
- Acquisitions activity was again at a high level in 1980, with 17 noteworthy acquisitions.
- Anacomp acquired SynerGraphics, Inc., which made Anacomp the world's largest total micrographics service company, according to a company spokesman.
 - Anacomp also acquired Computer Management, Inc. for \$1.4 million. CMI provides standard and customized computer software packages, microfilm services, and micrographics equipment and supplies.
 - It also acquired Arthur S. Kranzly and Company, a leader in electronic funds transfer (EFT) technology and banking software products.
 - In a major transaction, the Dun & Bradstreet Company has sold its Zytron operation to Anacomp. Zytron also provides micrographic services.
- Automatic Data Processing (ADP) acquired three industry-specialty vendors:
 - Business Systems Research, Inc., with revenues of about \$3.5 million from supplying computerized data bases and accounting systems for custom-house brokers, freight forwarders and others involved in international trade.

- Comtrend, Inc., with revenues of \$3.1 million from a computerized service that provides instantaneous graphic information on all active commodities, currencies and interest rate futures trading. The purchase price was over \$4 million.
- Certain operations of Statistical Tabulating Corp., which had revenues of about \$7.2 million from payroll and accounting services, for a purchase price of \$3.5 million as part of a settlement of a legal dispute.
- Burroughs Corp. acquired Systems Development Corp. for \$98 million.
- Computerized Automotive Reporting Services, Inc. (CARS) acquired General Computer Service, Inc. for \$1.4 million.
- Electronic Data Systems Corporation (EDS) acquired Applications Programming Service Inc. (APSI), which offers a comprehensive banking applications software package to banks with no prior in-house systems experience.
- EDS also expanded its hospital marketing effort with the acquisition of Information Resource Electronics, which offers a computer system used to manage administrative and medical information in hospitals.
- H&R Block, Inc., the nation's largest income tax preparation service, entered the computer services industry by acquiring CompuServe Inc. for \$23 million.
- Informatics moved into marketing systems software for small computers by acquiring Decision Strategy Corp.
- Schlumberger Ltd., an international firm based in France, entered the market by acquiring Manufacturing Data Systems, Inc. (MDSI) in a \$189 million stock exchange transaction.
- Tymshare, Inc. acquired Microband Corp. of America, which distributes commercial TV programs through local microwave networks. Tymshare plans

to utilize these networks for local data transmission at rates higher than can be provided by telephone companies' local loops. Microband's revenues are about \$3 million.

- Tymshare also acquired Medistat, Inc., which has revenues of about \$4 million from providing shared financial data processing services to hospitals.
- It also acquired Telecheck Services, Inc., which provides a computerized check guarantee service through the Tymshare Transactions Services, Inc. T3 digital authorization telephone/terminal.
- Wyly Corp. (University Computing Company) acquired Digital Systems of Florida for \$16.3 million. Digital Systems produced almost \$7 million in revenue in 1979, providing a combination of specialized software and hardware to accounting and construction firms.
- Additional major acquisitions, combined with internal growth, will result in at least 10 vendors having over \$200 million in revenues by the end of 1981.

B. THE LARGEST SOFTWARE PRODUCT VENDORS

- The software products industry is dominated by IBM, which has 42% of the INPUT Directory's software product revenues and 22% of all U.S. available software product user expenditures.
- IBM generates over six times more software products revenues than its closest competitor, Control Data Corporation, as shown in Exhibit V-2.

EXHIBIT V-2

THE LARGEST VENDORS OF SOFTWARE PRODUCTS
IN THE U.S. IN 1979

RANK	COMPANY	SOFTWARE PRODUCT REVENUE IN FISCAL 1979 (\$ MILLION)
1	IBM	\$425
2	CDC	70
3	BURROUGHS	50
4	HONEYWELL	40
5	DEC	35
5	NCR	35
7	MANAGEMENT SCIENCE AMERICA	30
8	INFORMATICS	25
9	SPERRY	20
9	HEWLETT-PACKARD	20
11	UCC	19
12	TEXAS INSTRUMENTS	15
12	DATA GENERAL	15
14	PANSOPHIC SYSTEMS	14
15	SOFTWARE AG OF NA	13
16	CINCOM SYSTEMS	12
16	INSURANCE SYSTEMS OF AMERICA	12

EXHIBIT V-2 (CONT.)

THE LARGEST VENDORS OF SOFTWARE PRODUCTS
IN THE U.S. IN 1979

RANK	COMPANY	SOFTWARE PRODUCT REVENUE IN FISCAL 1979 (\$ MILLION)
16	FLORIDA SOFTWARE SERVICES	\$12
19	SOFTWARE INTERNATIONAL	11
19	ADR	11
21	TANDY	10
21	COMPUTER ASSOCIATES	10

- The six largest software product vendors are all computer manufacturers whose revenues account for 31% of all U.S. available software products user expenditures.
- Management Science America is the largest vendor dedicated entirely to the sale of software products.
- The software products industry continues to be characterized by a large number of relatively small companies dedicated primarily to the sale of software products.
 - Twenty-two of these companies have revenues of \$10 million or more.
 - Most of them have a very limited and often fragmented product line.

C. THE LARGEST PROFESSIONAL SERVICES VENDORS

- The largest vendors of professional services are shown in Exhibit V-3.
- The largest vendor, CSC, had about 8% of the 1979 user expenditures for professional services.
- The eight vendors with \$50 million or more in professional services revenues accounted for 29% of 1979 user expenditures for these services.
- Only three computer manufacturers made this list and only one (IBM, with \$100 million in these revenues) is a major force in this industry.
- A majority of the firms offering professional services also offered processing services and software products.

EXHIBIT V-3

THE LARGEST VENDORS OF PROFESSIONAL SERVICES
IN THE U.S. IN 1979

RANK	COMPANY	PROFES- SIONAL SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)
1	CSC	\$230
2	SDC	145
3	IBM	100
4	MITRE	99
5	ARTHUR ANDERSEN	92
6	PRC	69
7	EDS	60
8	CDC	50
9	SYSTEMS CONSULTANTS	47
10	BRADFORD NATIONAL	44
11	SYSTEMS & COMPUTER TECH.	35
12	INFORMATICS	33
13	SCIENCE APPLICATIONS	30
14	AMERICAN MANAGEMENT SYSTEMS	25
14	ARTHUR D. LITTLE	25
16	BURROUGHS	20
16	HONEYWELL	20

EXHIBIT V-3 (CONT.)

THE LARGEST VENDORS OF PROFESSIONAL SERVICES
IN THE U.S. IN 1979

RANK	COMPANY	PROFES- SIONAL SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)
18	MARTIN MARIETTA	\$19
18	LOGICON	19
20	LAMDA TECHNOLOGY	18
21	MCAUTO	16
21	DATA RESOURCES	16
21	CACI	16
24	BCS	15
24	SCIENCE MANAGEMENT	15
24	CALCULON	15
27	DASD	14
27	FINANCIAL INDUSTRY SYSTEMS	14
29	APPLIED INFO. DEVELOPMENT	13
30	BOOZ ALLEN & HAMILTON	13
30	COMPUTER TASK GROUP	12
30	AGS COMPUTERS	12
30	ANALYSTS INTERNATIONAL	12
34	CUTLER WILLIAMS	11

EXHIBIT V-3 (CONT.)

THE LARGEST VENDORS OF PROFESSIONAL SERVICES
IN THE U.S. IN 1979

RANK	COMPANY	PROFES- SIONAL SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)
34	SYSTEMS & PROGRAMMING RESOURCES	\$11
36	NCR	10
36	SPERRY	10
36	KEANE ASSOCIATES	10
36	LITTON MELLONICS	10
36	RAND INFORMATION SYSTEMS	10
36	INTERMETRICS	10
36	TELOS COMPUTING	10
36	BOLT BERANEK & NEWMAN	10
36	TECH. DEVELOPMENT OF CA	10

- Only about 25% of the twenty-five largest professional services vendors offered professional services as their primary business.
- By far the majority of revenues for the largest companies comes from the federal government. Arthur Andersen is probably the largest vendor of professional services, excluding the government market.

D. THE LARGEST PROCESSING SERVICES VENDORS

- The processing services marketplace is one of the most competitive, with 18 vendors having \$50 million or more in processing services revenues, as shown in Exhibit V-4.
- Control Data Corp., the largest vendor of processing services, had only 5% of user expenditures for these services in 1979 and only 10% of the INPUT Directory's revenues for processing services.
- Processing services accounted for 58% of the computer services revenues generated by the INPUT Directory companies.
- Sixty-five percent of the INPUT Directory companies offer processing services, and of those, nearly 90% offer remote computing services.
- Other than CDC, NCR was the only computer manufacturer among the largest 25 vendors of processing services.
- The 25 largest vendors of processing services accounted for 40% of the INPUT Directory's computer services revenues.
- The largest vendors of remote computing services are shown in Exhibit V-5. Four vendors had more than \$100 million in remote computing services

EXHIBIT V-4

THE LARGEST VENDORS OF PROCESSING SERVICES
IN THE U.S. IN 1979

RANK	COMPANY	U.S. AVAILABLE PROCESSING SERVICES REVENUES FOR FISCAL 1979						
		PRO- CESSING SERVICES \$ MILLION	REMOTE COMPUTING		BATCH		FACILITIES MANAGEMENT	
			\$M	RANK	\$M	RANK	\$M	RANK
1	CDC	\$350	\$285	1	\$ 65	2	-	-
2	ADP	255	110	3	145	1	-	-
3	GEISCO	190	190	2	-	-	-	-
4	EDS	170	-	-	-	-	\$170	1
5	TYMSHARE	149	102	4	47	4	-	-
6	MCAUTO	105	55	9	-	-	50	3
7	CSC	90	84	5	6	25	-	-
8	NCSS	84	63	7	21	11	-	-
9	UNITED INFO. SYSTEMS	82	82	6	-	-	-	-
10	NCR	80	40	15	40	6	-	-
11	BRADFORD NATIONAL	76	51	10	25	7	-	-
12	SHARED MEDICAL SYSTEMS	70	-	-	-	-	70	2
12	BANK OF AMERICA	70	10	53	60	3	-	-
14	BCS	62	44	12	1	34	17	7
14	TRW	62	62	8	-	-	-	-

EXHIBIT V-4 (CONT.)

THE LARGEST VENDORS OF PROCESSING SERVICES
IN THE U.S. IN 1979

RANK		COMPANY	U.S. AVAILABLE PROCESSING SERVICES REVENUES FOR FISCAL 1979						
			PRO- CESSING SERVICES \$ MILLION	REMOTE COMPUTING		BATCH		FACILITIES MANAGEMENT	
				\$M	RANK	\$M	RANK	\$M	RANK
16		CHASE MANHATTAN BANK	\$53	\$43	13	\$10	18	-	-
17		FIRST DATA RESOURCES	50	-	-	-	-	\$50	3
17		NATIONAL DATA	50	37	18	-	-	13	10
19		CCH COMPUTAX	49	2	63	47	4	-	-
20		XEROX COMPUTER SERVICES	48	48	11	-	-	-	-
21		EQUIFAX, INC.	47	33	21	14	14	-	-
22		REYNOLDS & REYNOLDS	45	24	26	21	11	-	-
23		QUOTRON	43	43	13	-	-	-	-
24		TRANS UNION	42	37	18	5	26	-	-
25		A.C. NIELSEN	40	40	15	-	-	-	-
25		BUNKER RAMO	40	40	15	-	-	-	-
27		INFORMATICS	37	37	18	-	-	-	-
28		COMSHARE	36	32	22	4	28	-	-
29		NATIONAL SHAREDATA	33	7	60	10	18	16	9
30		TELECREDIT	32	30	23	2	31	-	-

EXHIBIT V-4 (CONT.)
THE LARGEST VENDORS OF PROCESSING SERVICES
IN THE U.S. IN 1979

U.S. AVAILABLE PROCESSING SERVICES REVENUES FOR FISCAL 1979									
RANK	COMPANY	PRO- CESSING SERVICES \$ MILLION	REMOTE COMPUTING		BATCH		FACILITIES MANAGEMENT		
			\$M	RANK	\$M	RANK	\$M	RANK	
31	OPTIMUM SYSTEMS	\$31	\$11	47	-	-	\$20	5	
32	MARTIN MARIETTA	30	25	24	-	-	5	14	
32	STATISTICAL TABULATING	30	6	61	\$24	8	-	-	
34	ANACOMP	29	16	36	9	21	4	16	
35	PRC	27	12	44	11	16	4	16	
36	ADVO	25	1	66	24	8	-	-	
36	OHIO COOP LIBRARY	25	25	24	-	-	-	-	
38	DATA RESOURCES	24	24	26	-	-	-	-	
39	SYSTEMATICS	23	-	-	17	13	6	12	
40	DIGICON	22	2	63	12	15	8	11	
40	MDSI	22	22	28	-	-	-	-	
40	AGENCY RECORDS CONTROL	22	-	-	22	10	-	-	
43	COMPUTER NETWORK	21	4	62	-	-	17	7	
44	MEAD CORP	20	20	29	-	-	-	-	
44	NY TIMES INFO. BANK	20	20	29	-	-	-	-	

EXHIBIT V-4 (CONT.)

THE LARGEST VENDORS OF PROCESSING SERVICES

IN THE U.S. IN 1979

		U.S. AVAILABLE PROCESSING SERVICES REVENUES FOR FISCAL 1979						
RANK	COMPANY	PRO- CESSING SERVICES \$ MILLION	REMOTE COMPUTING		BATCH		FACILITIES MANAGEMENT	
			\$M	RANK	\$M	RANK	\$M	RANK
44	NLT COMPUTER SERVICES	\$20	\$13	41	\$ 7	24	-	-
47	COMPUSERVE	19	19	31	-	-	-	-
47	CARS	19	19	31	-	-	-	-
47	UCC	19	17	34	2	31	-	-
47	SUN INFO. SERVICES	19	15	38	2	31	\$ 2	19
51	SEI	18	-	-	-	-	18	6
51	DOW JONES	18	18	33	-	-	-	-
51	CITIBANK	18	10	53	8	23	-	-
54	STANDARD & POORS	17	17	34	-	-	-	-
54	U.S. DATACORP	17	2	63	10	18	5	14
54	RAPIDATA	17	13	41	-	-	4	16
57	AMERICAN MANAGEMENT	16	11	47	5	26	-	-
57	TELECHECK	16	16	36	-	-	-	-
59	STSC	15	15	38	-	-	-	-
60	SDC	14	14	40	-	-	-	-

EXHIBIT V-4 (CONT.)
THE LARGEST VENDORS OF PROCESSING SERVICES
IN THE U.S. IN 1979

		U.S. AVAILABLE PROCESSING SERVICES REVENUES FOR FISCAL 1979							
RANK	COMPANY	PRO- CESSING SERVICES \$ MILLION	REMOTE COMPUTING		BATCH		FACILITIES MANAGEMENT		
			\$M	RANK	\$M	RANK	\$M	RANK	
61	KEYDATA	\$ 13	\$ 13	41	-	-	-	-	
62	ASSOCIATED PRESS	12	12	44	-	-	-	-	
62	THE COMPUTER CO.	12	3	-	\$ 3	29	\$ 6	12	
62	DATACROWN	12	11	47	1	34	-	-	
62	INT'L COMPUTAPRINT	12	12	44	-	-	-	-	
66	FINANCIAL DATA SYSTEMS	11	11	47	-	-	-	-	
66	DIAL COMPUTER SYSTEMS	11	11	47	-	-	-	-	
66	SAFEGUARD BUSINESS SYS.	11	-	-	11	16	-	-	
66	TECHNICON MED. INFO. SYS.	11	8	59	3	29	-	-	
66	BOWNE INFO. SYSTEMS	11	11	47	-	-	-	-	
71	COMPUTER SHARING SERVICES	10	10	53	-	-	-	-	
71	EASTERN AIRLINES	10	10	53	-	-	-	-	
71	LOCKHEED ELECTRONICS	10	10	53	-	-	-	-	
71	POORMAN-DOUGLAS	10	1	66	9	21	-	-	
71	SCIENCE DYNAMICS	10	10	53	-	-	-	-	
TOTAL		\$3,339	\$2,151	-	\$703	-	\$485	-	

**THE LARGEST VENDORS OF REMOTE COMPUTING SERVICES
IN THE U.S. IN 1979**

RANK	COMPANY	U.S. AVAILABLE REMOTE COMPUTING SERVICES REVENUES FOR FISCAL 1979						
		REMOTE COMPUT- ING \$ MILLION	INTERACTIVE		REMOTE BATCH		DATA BASE	
			\$M	RANK	\$M	RANK	\$M	RANK
1	CSC	\$285	\$220	1	\$65	2	-	-
2	GEISCO	190	90	2	90	1	\$10	16
3	ADP	110	70	3	40	5	-	-
4	TYMSHARE	102	59	5	43	4	-	-
5	CSC	84	21	12	55	3	8	21
6	UNITED INFO. SYSTEMS	82	62	4	20	11	-	-
7	NCSS	63	26	9	37	6	-	-
8	TRW	62	-	-	-	-	62	1
9	MCAUTO	55	28	8	27	9	-	-
10	BRADFORD NATIONAL	51	20	13	31	8	-	-
11	XEROX COMPUTER SERVICES	48	45	6	3	29	-	-
12	BCS	44	9	31	35	7	-	-
13	CHASE MANHATTAN BANK	43	19	15	8	24	16	11
13	QUOTRON	43	-	-	-	-	43	2
15	A.C. NIELSEN	40	20	13	-	-	20	6

EXHIBIT V-5 (CONT.)

THE LARGEST VENDORS OF REMOTE COMPUTING SERVICES
IN THE U.S. IN 1979

		U.S. AVAILABLE REMOTE COMPUTING SERVICES REVENUES FOR FISCAL 1979						
RANK	COMPANY	REMOTE COMPUT- ING \$ MILLION	INTERACTIVE		REMOTE BATCH		DATA BASE	
			\$M	RANK	\$M	RANK	\$M	RANK
15	BUNKER RAMO	\$40	-	-	-	-	\$40	3
15	NCR	40	\$15	18	\$25	10	-	-
18	NATIONAL DATA	37	37	7	-	-	-	-
18	TRANS UNION	37	-	-	15	14	22	5
18	INFORMATICS	37	15	18	20	11	2	23
21	EQUIFAX INC.	33	-	-	13	16	20	6
22	COMSHARE	32	8	32	19	13	5	22
23	TELECREDIT	30	-	-	-	-	30	4
24	MARTIN MARIETTA	25	13	22	12	17	-	-
24	OHIO COOP LIBRARY	25	15	18	-	-	10	16
26	DATA RESOURCES	24	14	21	-	-	10	16
26	REYNOLDS & REYNOLDS	24	24	10	-	-	-	-
28	MDSI	22	22	11	-	-	-	-
29	MEAD CORP.	20	-	-	-	-	20	6
29	NY TIMES INFO. BANK	20	-	-	-	-	20	6

THE LARGEST VENDORS OF REMOTE COMPUTING SERVICES
IN THE U.S. IN 1979

RANK	COMPANY	U.S. AVAILABLE REMOTE COMPUTING SERVICES REVENUES FOR FISCAL 1979						
		REMOTE COMPUT- ING \$ MILLION	INTERACTIVE		REMOTE BATCH		DATA BASE	
			\$M	RANK	\$M	RANK	\$M	RANK
31	COMPUERVE	\$19	\$17	16	\$ 2	31	-	-
31	CARS	19	8	33	11	19	-	-
33	DOW JONES	18	-	-	-	-	\$18	10
34	UCC	17	3	37	14	15	-	-
34	STANDARD & POORS	17	2	40	-	-	15	13
36	ANACOMP	16	16	17	-	-	-	-
36	TELECHECK	16	-	-	-	-	16	11
38	STSC	15	11	24	4	27	-	-
38	SUN INFO. SVCS	15	3	37	11	19	1	26
40	SDC	14	-	-	-	-	14	14
41	RAPIDATA	13	11	24	-	-	2	23
41	KEYDATA	13	13	22	-	-	-	-
41	NLT COMPUTER SERVICES	13	3	37	10	22	-	-
44	PRC	12	4	36	8	24	-	-
44	ASSOCIATED PRESS	12	-	-	-	-	12	15

EXHIBIT V-5 (CONT.)

THE LARGEST VENDORS OF REMOTE COMPUTING SERVICES
IN THE U.S. IN 1979

U.S. AVAILABLE REMOTE COMPUTING SERVICES REVENUES FOR FISCAL 1979								
RANK	COMPANY	REMOTE COMPUT- ING \$ MILLION	INTERACTIVE		REMOTE BATCH		DATA BASE	
			\$M	RANK	\$M	RANK	\$M	RANK
44	INT'L. COMPUTAPRINT	\$ 12	-	-	\$ 12	17	-	-
47	OPTIMUM SYSTEMS	11	-	-	11	19	-	-
47	AMERICAN MANAGEMENT	11	\$ 11	24	-	-	-	-
47	DATACROWN	11	2	40	7	26	\$ 2	23
47	FINANCIAL DATA SYSTEMS	11	11	24	-	-	-	-
47	DIAL COMPUTER SYSTEMS	11	11	24	-	-	-	-
47	BOWNE INFO. SYSTEMS	11	11	24	-	-	-	-
53	BANK OF AMERICA	10	-	-	10	22	-	-
53	CITIBANK	10	6	35	4	27	-	-
53	COMPUTER SHARING SVC.	10	7	34	3	29	-	-
53	EASTERN AIRLINES	10	-	-	-	-	10	16
53	LOCKHEED ELECTRONICS	10	-	-	-	-	10	16
53	SCIENCE DYNAMICS	10	10	30	-	-	-	-
TOTAL		\$2,115	\$1,012	-	\$665	-	\$438	-

revenues in 1979, and they accounted for 32% of all remote computing services revenues of the INPUT Directory companies in 1979.

- The largest vendors of batch services, shown in Exhibit V-6, tend to be industry or functionally specialized.
 - ADP and the Bank of America both provide payroll services.
 - C.C.H. Computax and Tymshare provide income tax processing services.
 - Agency Records Control, Statistical Tabulating, Reynolds & Reynolds and Safeguard Business Systems all provide accounting processing services.
- The largest vendors of facilities management processing services, shown in Exhibit V-7 usually concentrate on industry-specialized commercial sectors of the marketplace.
 - First Data Resources, SEI Corp. and National Data Corp. all derived large amounts of their revenues from the banking community.
 - EDS, Shared Medical Systems, Tymshare, Medicus and Medical Computer Systems focus on the health care industry.

E. ALPHABETICAL LIST OF THE INPUT DIRECTORY

- The companies in the INPUT Directory are listed in alphabetical order, along with their ranking, in Exhibit V-8.

EXHIBIT V-6

THE LARGEST VENDORS OF BATCH SERVICES
IN THE U.S. IN 1979

RANK	COMPANY	BATCH SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)
1	ADP	\$145
2	CDC	65
3	BANK OF AMERICA	60
4	TYMSHARE	47
4	CCH COMPUTAX	47
6	NCR	40
7	BRADFORD NATIONAL	25
8	STATISTICAL TABULATING	24
8	ADVO	24
10	AGENCY RECORDS CONTROL	22
11	NCSS	21
11	REYNOLDS & REYNOLDS	21
13	SYSTEMATICS	17
14	EQUIFAX	14
15	DIGICON	12
16	PRC	11

EXHIBIT V-6 (CONT.)

THE LARGEST VENDORS OF BATCH SERVICES
IN THE U.S. IN 1979

RANK	COMPANY	BATCH SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)
16	SAFEGUARD BUSINESS SYSTEMS	\$11
18	US DATACORP	10
18	NATIONAL SHAREDATA	10
18	CHASE MANHATTAN BANK	10

EXHIBIT V-7

**THE LARGEST VENDORS OF FACILITIES
MANAGEMENT PROCESSING SERVICES
IN THE U.S. IN 1979**

RANK	COMPANY	FACILITIES MANAGEMENT PROCESSING SERVICES REVENUE IN FISCAL 1979 (\$ MILLION)
1	EDS	\$170
2	SHARED MEDICAL SYSTEMS	70
3	MCAUTO	50
3	FIRST DATA RESOURCES	50
5	OPTIMUM SYSTEMS	20
6	SEI	18
7	BCS	17
7	COMPUTER NETWORK	17
9	NATIONAL SHAREDATA	16
10	NATIONAL DATA	13

EXHIBIT V-8

ALPHABETICAL LIST OF THE INPUT DIRECTORY

COMPANY	RANKING IN THE INPUT DIRECTORY
AGS Computers, Inc.	100
Advanced Computer Techniques Corporation	111
ADVO Systems, Inc. (ADVO)	53
Agency Records Control, Inc.	61
American Management Systems, Inc.	35
Amherst Associates, Inc.	111
Anacomp, Inc.	41
Analysts International Corporation	100
Applied Data Research, Inc. (ADR)	90
Applied Information Development, Inc.	90
Arthur Andersen & Company	12
Associated Press	100
Automatic Data Processing, Inc. (ADP)	4
Bank of America	19
Boeing Computer Services, Inc. (BCS)	17
Bolt Beranek and Newman, Inc.	118
Booz Allen & Hamilton, Inc.	100
Bowne Information Systems, Inc.	100
Bradford National Corporation	11
Bunker Ramo Corporation	36
Burroughs Corporation	19

EXHIBIT V-8 (CONT.)

ALPHABETICAL LIST OF THE INPUT DIRECTORY

COMPANY	RANKING IN THE INPUT DIRECTORY
C.A.C.I., Inc.	76
CCH Computax, Inc.	29
Calculon Corporation	84
Chase Manhattan Bank	24
Cincom Systems, Inc.	95
Citibank	71
Compuserve, Inc.	67
Computer Associates, Inc.	118
Computer Company, The	90
Computer Network Corporation (COMNET)	61
Computer Sciences Corporation (CSC)	3
Computer Sharing Services, Inc.	118
Computer Task Group, Inc.	90
Computerized Automotive Reporting Service, Inc. (CARS)	67
Comshare, Inc.	41
Control Data Corporation (CDC)	2
Cullinane Corporation	118
Cutler Williams, Inc.	110
DASD Corporation	84
Data Communications Corporation	118
Data General Corporation	84
Data Resources, Inc. (DRI)	36

EXHIBIT V-8 (CONT.)

ALPHABETICAL LIST OF THE INPUT DIRECTORY

COMPANY	RANKING IN THE INPUT DIRECTORY
Datacrown, Inc.	100
Dial Computer Systems Corporation	100
Digicon, Inc.	56
Digital Equipment Corporation (DEC)	36
Dow Jones & Company, Inc.	71
Eastern Air Lines, Inc.	118
Electronic Data Systems Corporation (EDS)	5
Equifax, Inc.	30
Financial Data Systems, Inc.	100
Financial Industry Systems	71
First Data Resources, Inc.	27
Florida Software Services, Inc.	79
General Electric Information Services Company (GEISCO)	6
Hewlett-Packard Company	53
Honeywell, Inc.	23
Imperial Computer Services, Inc.	118
Informatics, Inc.	15
Information Science, Inc.	95

EXHIBIT V-8 (CONT.)

ALPHABETICAL LIST OF THE INPUT DIRECTORY

COMPANY	RANKING IN THE INPUT DIRECTORY
Information Systems Design, Inc.	118
Insurance Systems of America	84
Intermetrics, Inc.	100
International Business Machines Corporation (IBM)	1
International Computaprint Corporation	100
Keane Associates, Inc.	79
Keydata Corporation	95
Lambda Technology	71
Little, Arthur D., Inc.	47
Litton Mellonics	84
Lockheed Information Systems	79
Logicon, Inc.	67
Management Science America, Inc.	47
Manufacturing Data Systems, Inc. (MDSI)	56
Martin Marietta Data Systems	25
McDonnell Douglas Automation Company (McAUTO)	9
Mead Corporation	59
Medicus Systems Corporation	62
Mitre Corporation	13

EXHIBIT V-8 (CONT.)

ALPHABETICAL LIST OF THE INPUT DIRECTORY

COMPANY	RANKING IN THE INPUT DIRECTORY
NCR Corporation	9
NLT Computer Services Corporation	62
National CSS, Inc.	16
National Data Corporation	27
National Sharedata Corporation	44
New York Times Information Bank	62
Nielsen (A.C.) Company	36
OA0	118
Ohio Cooperative Library Corporation	53
Optimum Systems, Inc.(OSI)	46
Pansophic Systems, Inc.	90
Pentamation Enterprises, Inc.	118
Planning Research Corporation (PRC)	14
Poorman-Douglas Corporation	118
Quotron Systems, Inc.	33
Rand Information Systems, Inc.	95
Rapidata, Inc.	62
Reynolds and Reynolds Company, The	32

EXHIBIT V-8 (CONT.)

ALPHABETICAL LIST OF THE INPUT DIRECTORY

COMPANY	RANKING IN THE INPUT DIRECTORY
SEI Corporation	71
STSC, Inc.	79
Safeguard Business Systems, Inc.	111
Science Applications, Inc.	47
Science Dynamics Corporation	118
Science Management Corporation	67
Seibels Bruce & Company	111
Shared Medical Systems Corporation	19
Software AG of North America, Inc.	95
Software Design Associates, Inc.	100
Software International Corporation	111
Sperry Corporation	47
Standard & Poors Corporation	76
Statistical Tabulating Corporation	47
Sun Information Services Company	52
System Development Corporation (SDC)	7
Systematics, Inc.	56
Systems and Computer Technology Corporation	43
Systems Consultants, Inc.	30
Systems and Programming Resources, Inc.	111
Tandy Corporation	118
Technicon Medical Information Systems Corporation	62

EXHIBIT V-8 (CONT.)

ALPHABETICAL LIST OF THE INPUT DIRECTORY

COMPANY	RANKING IN THE INPUT DIRECTORY
Technology Development of California	118
Telecheck, Inc.	79
Telecredit, Inc.	45
Telos Computing	118
Texas Instruments	84
Trans Union Corporation	34
TRW Information Services	22
Tymshare, Inc.	8
U.S. Datacorp	76
United Information Systems, Inc.	18
University Computing Company (UCC)	40
Xerox Computer Services	26

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

COMPUTER SERVICES

- These are services provided by vendors which perform data processing functions using vendors' computers (processing services) or assist users to perform such functions on their own computers (software products and/or professional services).
- The following are definitions of the modes of service used in this report.
 - Remote Computing Services (RCS) provide data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. There are three submodes of RCS:
 - Interactive (timesharing) is characterized by the interaction of the user with the system, primarily for problem-solving timesharing but also for data entry and transaction processing: the user is on-line to the program/files.
 - Remote Batch is where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements.

- Data Base is characterized by the retrieval and processing of information from a vendor-maintained data base. The data base may be owned by the vendor or a third party.
- User Site Hardware Services (USHS). These offerings provided by RCS vendors place programmable hardware on the user's site (rather than the EDP center). USHS offers:
 - Access to a communications network.
 - Access through the network to the RCS vendor's larger computers.
 - Significant software as part of the service.
- Batch Services include data processing performed at vendors' sites of user programs and/or data which are physically transported (as opposed to electronically, by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and COM processing, are also included. Batch services include those expenditures by users who take their data to a vendor's site, where a terminal connected to a remote computer is used for the actual processing.
- Processing Services Facilities Management (FM). (Also referred to as "Resource Management" or "Systems Management.") The management of all or a significant part of a user's data processing functions under a long-term contract (not less than one year). To qualify as processing services FM, the contractor must directly plan and control as well as operate its own computers/communications network, including providing computers at the client's site, to deliver the service. Simply providing resources, even though under a long-term contract, and/or providing for all of a user's processing needs, does not necessarily qualify as FM.

TYPES OF PROCESSING SERVICES

- Processing services encompass processing services facilities management, remote computing services and batch services. They are categorized by type of services bought by users as follows:
 - Function Specific services are the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but cut across industry lines. Most general ledger, accounts receivable, payroll and personnel applications fall into this category. General purpose tools such as financial planning systems, linear regression packages and other statistical routines are also included in this category. However, when the application or tool is designed for specific industry usage, then the service is industry specific.
 - Industry Specific services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications "tool" which the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation; data base services, where the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry specialty applications are: seismic data processing, numerically controlled machine tool software development and demand deposit accounting.
 - Utility services are those where the vendor provides access to a computer and/or communications network with basic software that enables any user to develop its own problem solution or processing system. These basic tools include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines and other systems software.

USE OF PROCESSING SERVICES

- Processing can be categorized by use as follows:
 - Transaction Processing indicates those services where the primary or predominant purpose of the application is to process transactions, usually in a highly repetitive fashion. Most business accounting fits into this category. Payroll, accounts receivable, order entry, portfolio accounting and inventory control are all good examples of transaction processing.
 - Information Analysis services are processing services where the primary or predominant purpose of the application is to convert data into information through the use of mathematical, statistical or financial analysis tools that readily and easily display the results in report or graphical form. The tools may be rapidly adapted to address a variety of nonrepetitive problems. These tools are often in the areas of financial analysis, marketing, planning and statistical analysis. Many of the techniques incorporated have their origins in scientific and engineering applications, which also generally fall within this category.
 - User Data Base Management services are processing services where the primary or predominant purpose of the application is to organize and maintain a data base of user information in a manner that facilitates its rapid and efficient retrieval and display according to user-defined parameters, either in ad hoc or fixed form.
 - Vendor Data Base services are processing services where the primary or predominant purpose of the application is to retrieve and/or process data supplied by the vendor who controls access to it (although it may be owned by a third party). There are two modes of delivery of this service:

- Inquiry data base services provide a means of selection and retrieval of data only. They neither provide, nor usually allow, for the subsequent processing of the data. Stock market statistics, news services and bibliographic data bases are commonly offered in this mode.
- Application Processing services, in addition to providing a means of selection and retrieval, also provide a means of further processing the data into information through the full use of information analysis tools and data base management systems, which permit the merging of vendor data with user data. Demographic, marketing and financial and economic data bases are commonly offered in this mode.

PROFESSIONAL SERVICES

- This category is made up of services related to EDP, including professional services facilities management, system design, custom/contract programming, consulting, education and training. Services are provided on the basis of:
 - Time and Materials - The billing rate is measured in units of time, rather than actual costs.
 - Fixed Price - A firm price is agreed upon for a defined piece of work.
 - Cost Plus Fee - The billing rate depends on actual costs plus a fixed fee.
- Professional Services Facilities Management is the management of all or a significant part of a user's data processing functions under a long-term contract (not less than one year). To qualify as professional services facilities management, the contractor must directly plan and control as well as operate

the client's facility, where the computers are owned by the client. Simply providing resources, even though under a long-term contract, does not necessarily qualify as professional services facilities management.

SOFTWARE PRODUCTS

- This category includes the user's purchase of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures as well as fees for work performed by the vendor to implement and maintain the package at the user's site(s). Fees for work performed by organizations other than the package vendor are counted in professional services. There are several subcategories of software products:
 - Application Products are software products which perform processing to serve user functions. They consist of:
 - Cross-industry products, which are used in multiple-user industry sectors. Examples are payroll, inventory control and financial planning.
 - Industry-specialized products, which are used in a specific industry sector such as banking and finance, transportation or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.
 - System Products are software products which enable the computer/communications system to perform basic functions. They consist of:
 - System operations products, which function during applications program execution to manage the computer system resource. Examples include operating systems, DBMS, communication monitors, emulators and spoolers.

- System utilization products, used by operations personnel to utilize the computer system more effectively. Examples include performance measurement, job accounting, computer operations scheduling and utilities.
- System implementation products, used to prepare applications for execution by assisting in designing, programming, testing and related functions. Examples include languages, sorts, productivity aids, data dictionaries, report writers, project control systems and retrieval systems.

TURNKEY SYSTEMS

- A turnkey system is a combination of hardware and software integrated into a total system designed to fulfill the processing requirements of an application (or applications) for a user.

OTHER CONSIDERATIONS

- All expenditures and revenues addressed are "available" in that they are open for competition. "Captive" figures, which refer to expenditures by a user for services from a subsidiary company, such as Boeing Aircraft with Boeing Computer Services (BCS), are not included. They may be referred to when examining an individual "spin-off" vendor, such as BCS.
- When any questions arise as to the proper place to count certain user expenditures, INPUT addresses the questions from the user viewpoint and categorizes the expenditures according to the answer to the question, "What do the users perceive they are buying?"
- Industry sectors used in this report are defined in Exhibit A-1.

EXHIBIT A-1

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
DISCRETE MANUFACTURING	23	APPAREL
	25	FURNITURE
	27	PRINTING
	31	LEATHER
	34	METAL
	35	MACHINERY
	36	ELECTRONICS
	37	TRANSPORTATION
	38	SCIENTIFIC AND CONTROL INSTRUMENTS
PROCESS MANUFACTURING	39	MISCELLANEOUS MFG.
	10	METAL MINING
	11	ANTHRACITE MINING
	12	COAL MINING
	13	OIL AND GAS EXTRACTION
	20	FOOD PRODUCTS
	21	TOBACCO
	22	TEXTILE PRODUCTS
	24	LUMBER AND WOOD PRODUCTS
	26	PAPER PRODUCTS
	28	CHEMICALS
	29	PETROLEUM
	30	RUBBER AND PLASTICS
	32	STONE, GLASS, CLAY
	33	PRIMARY METALS

EXHIBIT A-1 (CONTD.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
EDUCATION	82	EDUCATIONAL SERVICES
RETAIL	52	BUILDING MATERIALS, HARDWARE
	53	GENERAL MERCHANDISE
	54	FOOD
	55	AUTOMOTIVE AND GAS STATIONS
	56	APPAREL
	57	FURNITURE
	58	EATING AND DRINKING
	59	MISCELLANEOUS RETAIL
WHOLESALE	50	DURABLE GOODS
	51	NON-DURABLE GOODS
STATE AND LOCAL GOVERNMENT	91-97	AS APPROPRIATE
FEDERAL GOVERNMENT	91-97	AS APPROPRIATE
SERVICES	73	BUSINESS SERVICES

EXHIBIT A-1 (CONTD.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
TRANSPORTATION	40	RAILROADS
	41	LOCAL TRANSIT
	42	MOTOR FREIGHT
	43	U.S. POSTAL SERVICE
	44	WATER TRANSPORTATION
	45	AIR
	46	PIPELINES
	47	TRANSPORTATION SERVICES
UTILITIES	48	COMMUNICATIONS
	49	ELECTRIC, GAS, & SANITARY
BANKING AND FINANCE	60	BANKS
	61	CREDIT AGENCIES
	62	SECURITY AND COMMODITY BROKERS
	67	HOLDING AND INVESTMENT OFFICES
INSURANCE	63	INSURANCE (LIFE, HEALTH, ETC.)
	64	INSURANCE AGENTS
MEDICAL	80	HEALTH SERVICES

EXHIBIT A-1 (CONTD.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
OTHER INDUSTRIES	01-09	AGRICULTURE, FORESTRY, AND FISHING
	15-17	CONSTRUCTION
	65	REAL ESTATE
	66	COMBINATIONS OF REAL ESTATE, INSURANCE, LOANS, LAW OFFICES
	70	HOTELS, ROOMING HOUSES, CAMPS, AND OTHER LODGING PLACES
	72	PERSONAL SERVICES
	75	AUTOMOTIVE REPAIR, SERVICES, AND GARAGES
	76	MISCELLANEOUS REPAIR SERVICES
	78	MOTION PICTURES
	79	AMUSEMENT AND RECREATION SERVICES, EXCEPT MOTION PICTURES
	83	SOCIAL SERVICES
	84	MUSEUMS, ART GALLERIES, BOTANICAL AND ZOOLOGICAL GARDENS
	86	MEMBERSHIP ORGANIZATIONS
	89	MISCELLANEOUS SERVICES

APPENDIX B: INDUSTRY SECTOR FORECASTS

APPENDIX B: INDUSTRY SECTOR FORECASTS

- The industry sector forecasts are grouped together in this section.
- Industry specialization alone is not enough to compete successfully in today's market. The real key is product/service specialization.
- Once an industry is selected, the market must be studied in detail to determine the users' needs for a particular product or service.
- Exhibits B-1 through B-30 detail the industry forecasts by mode and type of service.

EXHIBIT B-1

**MARKET FORECAST FOR PROCESSING SERVICES -
DISCRETE MANUFACTURING SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$110	\$130	20%	\$ 160	\$ 190	\$ 230	\$ 275	\$ 335	21%
	INDUSTRY SPECIFIC	246	315	28	400	515	650	830	1,035	27
	UTILITY	76	90	18	105	125	150	175	210	18
SUBTOTAL		\$432	\$535	24%	\$ 665	\$ 830	\$1,030	\$1,280	\$1,580	24%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	5	6	10	7	7	8	9	10	11
	INDUSTRY SPECIFIC	31	37	18	44	52	61	72	86	18
	UTILITY	24	28	17	33	39	45	53	62	17
SUBTOTAL		\$ 60	\$ 71	18%	\$ 84	\$ 98	\$ 114	\$ 134	\$ 158	17%
BATCH	FUNCTION SPECIFIC	210	225	7	240	260	280	300	320	7
	INDUSTRY SPECIFIC	60	66	11	75	85	90	100	115	12
	UTILITY	60	64	6	67	72	76	81	87	6
SUBTOTAL		\$330	\$355	8%	\$ 382	\$ 417	\$ 446	\$ 481	\$ 522	8%
TOTAL PROCESSING	FUNCTION SPECIFIC	325	361	11	407	457	518	584	665	13
	INDUSTRY SPECIFIC	337	418	24	519	652	801	1,002	1,236	24
	UTILITY	160	182	13	205	236	271	309	359	15
GRAND TOTAL		\$822	\$961	17%	\$1,131	\$1,345	\$1,590	\$1,895	\$2,260	19%

EXHIBIT B-2

COMPUTER SERVICES MARKET FORECAST - DISCRETE MANUFACTURING SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 432	\$ 535	24%	\$ 665	\$ 830	\$1,030	\$1,280	\$1,580	24%
FACILITIES MANAGEMENT		60	71	18	84	98	114	134	158	17
BATCH		330	355	8	382	417	446	481	522	8
SUBTOTAL PROCESSING		\$ 822	\$ 961	17%	\$1,131	\$1,345	\$1,590	\$1,895	\$2,260	19%
SOFTWARE PRODUCTS	SYSTEMS	280	370	32	480	630	830	1,090	1,420	31
	APPLICA-TIONS	110	140	29	180	240	305	400	510	-
SUBTOTAL SOFTWARE PRODUCTS		\$ 390	\$ 510	31%	\$ 660	\$ 870	\$1,135	\$1,490	\$1,930	31%
PROFES-SIONAL SERVICES	SERVICES	490	600	22	730	900	1,115	1,380	1,725	24
	FACILITIES MANAGE-MENT	5	5	0	5	5	5	5	5	0
SUBTOTAL PROFES-SIONAL SERVICES		\$ 495	\$ 605	22%	\$ 735	\$ 905	\$1,120	\$1,385	\$1,730	23%
GRAND TOTAL		\$1,707	\$2,076	22%	\$2,526	\$3,120	\$3,845	\$4,770	\$5,920	24%

EXHIBIT B-3

MARKET FORECAST FOR PROCESSING SERVICES -
PROCESS MANUFACTURING SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 90	\$117	30%	\$148	\$196	\$ 242	\$ 315	\$ 400	28%
	INDUSTRY SPECIFIC	35	43	22	52	64	78	95	120	23
	UTILITY	165	200	22	245	300	370	450	550	22
SUBTOTAL		\$290	²⁴⁰ \$360	24%	\$445	\$560	\$ 690	\$ 860	\$1,070	24%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	2	2	15	3	3	4	4	5	20
	INDUSTRY SPECIFIC	33	39	17	45	53	62	73	86	17
	UTILITY	5	6	19	7	8	10	12	14	18
SUBTOTAL		\$ 40	\$ 47	18%	\$ 55	\$ 64	\$ 76	\$ 89	\$ 105	17%
BATCH	FUNCTION SPECIFIC	65	²⁰ 73	12	82	92	103	155	130	12
	INDUSTRY SPECIFIC	100	²⁹⁰ ~~122~~ ~~127~~	22	150	180	255	270	335	22
	UTILITY	45	¹⁷ 46	3	48	50	51	53	55	4
SUBTOTAL		\$210	³²⁷ \$241	15%	\$280	\$322	\$ 409	\$ 478	\$ 520	17%
TOTAL PROCESSING	FUNCTION SPECIFIC	157	192	22	233	291	349	474	535	23
	INDUSTRY SPECIFIC	168	204	21	247	297	395	438	541	22
	UTILITY	215	252	17	300	358	431	515	619	20
GRAND TOTAL		\$540	\$648	20%	\$780	\$946	\$1,175	\$1,427	\$1,695	21%

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EXHIBIT B-4

**COMPUTER SERVICES MARKET FORECAST -
PROCESS MANUFACTURING SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 290	\$ 360	24%	\$ 445	\$ 560	\$ 690	\$ 860	\$1,070	24%
FACILITIES MANAGEMENT		40	47	18	55	64	76	89	105	17
BATCH		210	241	15	280	322	379	478	520	17
SUBTOTAL PROCESSING		\$ 540	\$ 648	20%	\$ 780	\$ 946	\$1,145	\$1,427	\$1,695	21%
SOFTWARE PRODUCTS	SYSTEMS	160	220 <i>100</i>	38	300	400	540	730	970	35
	APPLICATIONS	40	52 <i>50</i>	31	69	90	120	155	205	32
SUBTOTAL SOFTWARE PRODUCTS		\$ 200	\$ 272 <i>150</i>	36%	\$ 369	\$ 490	\$ 660	\$ 885	\$1,175	35%
PROFESSIONAL SERVICES	SERVICES	265	320	20	380	460	555	665	805	20
	FACILITIES MANAGEMENT	5	5	0	5	5	5	5	5	0
SUBTOTAL PROFESSIONAL SERVICES		\$ 270	\$ 325 <i>114</i>	20%	\$ 385	\$ 465	\$ 560	\$ 670	\$ 810	20%
GRAND TOTAL		\$1,010	\$1,245	24%	\$1,534	\$1,901	\$2,365	\$2,982	\$3,680	25%

EXHIBIT B-5

MARKET FORECAST FOR PROCESSING SERVICES -
TRANSPORATION SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 20	\$ 23	15%	\$ 26	\$ 31	\$ 35	\$ 38	\$ 42	13%
	INDUSTRY SPECIFIC	40	50	25	63	80	100	125	155	25
	UTILITY	20	23	16	26	29	35	37	43	13
SUBTOTAL		\$ 80	\$ 96	20%	\$115	\$140	\$170	\$200	\$240	20%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	30	33	11	37	41	46	51	57	12
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		\$ 30	\$ 33	11%	\$ 37	\$ 41	\$ 46	\$ 51	\$ 57	12%
BATCH	FUNCTION SPECIFIC	15	16	9	18	20	21	23	26	10
	INDUSTRY SPECIFIC	20	22	11	25	28	31	34	38	12
	UTILITY	10	10	0	10	10	10	10	10	0
SUBTOTAL		\$ 45	\$ 48	7%	\$ 53	\$ 58	\$ 62	\$ 67	\$ 74	9%
TOTAL PROCESSING	FUNCTION SPECIFIC	35	39	11	44	51	56	61	68	12
	INDUSTRY SPECIFIC	90	105	16	125	149	177	210	250	19
	UTILITY	30	33	10	36	39	45	47	53	10
GRAND TOTAL		\$155	\$177	14%	\$205	\$239	\$278	\$318	\$371	16%

EXHIBIT B-6

**COMPUTER SERVICES MARKET FORECAST -
TRANSPORTATION SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 80	\$ 96	20%	\$115	\$140	\$170	\$200	\$ 240	20%
FACILITIES MANAGEMENT		30	33	11	37	41	46	51	57	12
BATCH		45	48	7	53	58	62	67	74	9
SUBTOTAL PROCESSING		\$155	\$177	14%	\$205	\$239	\$278	\$318	\$ 371	16%
SOFTWARE PRODUCTS	SYSTEMS	46	63	36	85	115	160	215	290	36
	APPLICA-TIONS	20	27	35	37	50	67	90	125	-
SUBTOTAL SOFTWARE PRODUCTS		\$ 66	\$ 90	36%	\$122	\$165	\$227	\$305	\$ 415	36%
PROFES-SIONAL SERVICES	SERVICES	65	83	27	105	135	170	215	280	28
	FACILITIES MANAGE-MENT	-	-	-	-	-	-	-	-	-
SUBTOTAL PROFES-SIONAL SERVICES		\$ 65	\$ 83	27%	\$105	\$135	\$170	\$215	\$ 280	28%
GRAND TOTAL		\$286	\$350	22%	\$432	\$539	\$675	\$838	\$1,066	25%

EXHIBIT B-7

**MARKET FORECAST FOR PROCESSING SERVICES -
UTILITIES SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 60	\$ 72	20%	\$ 90	\$110	\$130	\$150	\$185	21%
	INDUSTRY SPECIFIC	70	86	23	105	130	160	200	245	23
	UTILITY	100	112	12	125	140	160	180	200	12
SUBTOTAL		\$230	\$270	18%	\$320	\$380	\$450	\$530	\$630	18%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	2	2	0	2	2	2	2	2	0
	INDUSTRY SPECIFIC	2	2	0	2	2	2	2	2	0
	UTILITY	11	12	11	14	15	17	19	21	12
SUBTOTAL		\$ 15	\$ 16	7%	\$ 18	\$ 19	\$ 21	\$ 23	\$ 25	9%
BATCH	FUNCTION SPECIFIC	30	32	8	35	38	41	44	48	8
	INDUSTRY SPECIFIC	10	10	4	11	11	12	12	13	5
	UTILITY	20	20	0	20	20	20	20	20	0
SUBTOTAL		\$ 60	\$ 62	3%	\$ 66	\$ 69	\$ 73	\$ 76	\$ 81	5%
TOTAL PROCESSING	FUNCTION SPECIFIC	92	106	15	127	150	173	196	235	17
	INDUSTRY SPECIFIC	82	98	19	118	143	174	214	260	22
	UTILITY	131	144	10	159	175	197	219	241	11
GRAND TOTAL		\$305	\$348	14%	\$404	\$468	\$544	\$629	\$736	16%

EXHIBIT B-8

COMPUTER SERVICES MARKET FORECAST -
UTILITIES SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$230	\$270	18%	\$320	\$380	\$ 450	\$ 530	\$ 630	18%
FACILITIES MANAGEMENT		15	16	7	18	19	21	23	25	-
BATCH		60	62	3	66	69	73	76	81	5
SUBTOTAL PROCESSING		\$305	\$348	14%	\$404	\$468	\$ 544	\$ 629	\$ 736	16%
SOFTWARE PRODUCTS	SYSTEMS	55	73	32	95	130	170	220	295	-
	APPLICA-TIONS	15	18	20	22	26	31	38	45	20
SUBTOTAL SOFTWARE PRODUCTS		\$ 70	\$ 91	30%	\$117	\$156	\$ 201	\$ 258	\$ 340	30%
PROFES-SIONAL SERVICES	SERVICES	145	170	17	200	230	275	320	380	17
	FACILITIES MANAGE-MENT	5	6	17	7	8	9	11	13	16
SUBTOTAL PROFES-SIONAL SERVICES		\$150	\$176	17%	\$207	\$238	\$ 284	\$ 331	\$ 393	17%
GRAND TOTAL		\$525	\$615	17%	\$728	\$862	\$1,029	\$1,218	\$1,469	19%

EXHIBIT B-9

**MARKET FORECAST FOR PROCESSING SERVICES -
BANKING AND FINANCE SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 70	\$ 79	13%	\$ 98	\$ 124	\$ 136	\$ 166	\$ 205	21%
	INDUSTRY SPECIFIC	540	670	23	820	1,010	1,250	1,530	1,900	23
	UTILITY	45	51	13	57	66	74	84	95	13
SUBTOTAL		\$ 655	\$ 800	\$ 22	\$ 975	\$1,200	\$1,460	\$1,780	\$2,200	22%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	255	300	17	350	410	480	560	670	17
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		\$ 255	\$ 300	17%	\$ 350	\$ 410	\$ 480	\$ 560	\$ 670	17%
BATCH	FUNCTION SPECIFIC	130	140	9	155	170	185	200	220	9
	INDUSTRY SPECIFIC	450	480	7	520	560	600	640	690	8
	UTILITY	10	10	11	12	14	15	17	19	14
SUBTOTAL		\$ 590	\$ 630	7%	\$ 687	\$ 744	\$ 800	\$ 857	\$ 929	8%
TOTAL PROCESSING	FUNCTION SPECIFIC	200	219	9	253	294	321	366	425	14
	INDUSTRY SPECIFIC	1,245	1,450	16	1,690	1,980	2,330	2,730	3,260	18
	UTILITY	55	61	11	69	80	89	101	114	13
GRAND TOTAL		\$1,500	\$1,730	15%	\$2,012	\$2,354	\$2,740	\$3,197	\$3,799	17%

EXHIBIT B-10

COMPUTER SERVICES MARKET FORECAST -
BANKING AND FINANCE SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 655	\$ 800	22%	\$ 975	\$1,200	\$1,460	\$1,780	\$2,200	22%
FACILITIES MANAGEMENT		255	300	17	350	410	480	560	670	17
BATCH		590	630	7	687	744	800	857	929	8
SUBTOTAL PROCESSING		\$1,500	\$,1730	15%	\$2,012	\$2,354	\$2,740	\$3,197	\$3,799	17%
SOFTWARE PRODUCTS	SYSTEMS	70	90	29	120	150	200	260	340	30
	APPLICA-TIONS	190	220	16	255	300	345	400	470	16
SUBTOTAL SOFTWARE PRODUCTS		\$ 260	\$ 310	19%	\$ 375	\$ 450	\$ 545	\$ 660	\$ 810	22%
PROFES-SIONAL SERVICES	SERVICES	230	265	15	305	355	405	470	540	15
	FACILITIES MANAGE-MENT	20	23	15	26	31	35	41	47	15
SUBTOTAL PROFES-SIONAL SERVICES		\$ 250	\$ 288	15%	\$ 331	\$ 386	\$ 440	\$ 511	\$ 587	15
GRAND TOTAL		\$2,010	\$2,328	16%	\$2,718	\$3,190	\$3,725	\$4,368	\$5,196	18%

EXHIBIT B-11

MARKET FORECAST FOR PROCESSING SERVICES -
INSURANCE SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 65	\$ 78	20%	\$ 90	\$102	\$ 119	\$ 146	\$ 167	16%
	INDUSTRY SPECIFIC	70	85	21	100	125	150	180	220	21
	UTILITY	20	22	11	25	28	31	34	38	12
SUBTOTAL		\$155	\$185	18%	\$215	\$255	\$ 300	\$ 360	\$ 425	18%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	428	480	13	550	620	700	800	910	14
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		\$428	\$480	13%	\$550	\$620	\$ 700	\$ 800	\$ 910	14%
BATCH	FUNCTION SPECIFIC	20	21	6	22	24	25	27	29	7
	INDUSTRY SPECIFIC	65	70	8	76	83	90	95	105	8
	UTILITY	10	11	6	11	12	13	14	14	5
SUBTOTAL		\$ 95	\$102	7%	\$109	\$119	\$ 128	\$ 136	\$ 148	8%
TOTAL PROCESSING	FUNCTION SPECIFIC	85	99	16	112	126	144	173	196	15
	INDUSTRY SPECIFIC	563	635	13	726	828	940	1,075	1,235	14
	UTILITY	30	33	10	36	40	44	48	52	9
GRAND TOTAL		\$678	\$767	13%	\$874	\$994	\$1,128	\$1,296	\$1,483	14%

EXHIBIT B-12

**COMPUTER SERVICES MARKET FORECAST -
INSURANCE SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 155	\$ 185	18%	\$ 215	\$ 255	\$ 300	\$ 360	\$ 425	18%
FACILITIES MANAGEMENT		428	480	13	550	620	700	800	910	14
BATCH		95	102	7	109	119	128	136	148	8
SUBTOTAL PROCESSING		\$ 678	\$ 767	13%	\$ 874	\$ 994	\$1,128	\$1,296	\$1,483	14%
SOFTWARE PRODUCTS	SYSTEMS	80	105	31	140	180	230	300	390	30
	APPLICATIONS	130	150	15	170	200	230	260	305	15
SUBTOTAL SOFTWARE PRODUCTS		\$ 210	\$ 255	21%	\$ 310	\$ 380	\$ 460	\$ 560	\$ 695	22%
PROFESSIONAL SERVICES	SERVICES	200	225	12	250	280	320	355	400	12
	FACILITIES MANAGEMENT	40	45	12	50	57	64	71	80	12
SUBTOTAL PROFESSIONAL SERVICES		\$ 240	\$ 270	12%	\$ 300	\$ 337	\$ 384	\$ 426	\$ 480	12%
GRAND TOTAL		\$1,128	\$1,292	15%	\$1,484	\$1,711	\$1,972	\$2,282	\$2,658	16%

EXHIBIT B-13

**MARKET FORECAST FOR PROCESSING SERVICES -
MEDICAL SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 13	\$ 16	23%	\$ 20	\$ 24	\$ 30	\$ 37	\$ 46	24%
	INDUSTRY SPECIFIC	120	146	23	180	224	276	346	424	24
	UTILITY	7	8	19	10	12	14	17	20	20
SUBTOTAL		\$140	\$170	23%	\$210	\$260	\$320	\$400	\$ 490	24%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	160	180	13	205	235	265	300	340	14
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		\$160	\$180	13%	\$205	\$235	\$265	\$300	\$ 340	14%
BATCH	FUNCTION SPECIFIC	20	23	15	26	31	35	41	47	15
	INDUSTRY SPECIFIC	125	135	6	140	150	160	170	180	6
	UTILITY	10	10	0	10	10	10	10	10	0
SUBTOTAL		\$155	\$168	8%	\$176	\$191	\$205	\$221	\$ 237	7%
TOTAL PROCESSING	FUNCTION SPECIFIC	33	39	18	46	55	65	78	93	19
	INDUSTRY SPECIFIC	405	461	14	525	609	701	816	944	15
	UTILITY	17	18	6	20	22	24	27	30	11
GRAND TOTAL		\$455	\$518	14%	\$591	\$686	\$790	\$921	\$1,067	16%

EXHIBIT B-14

COMPUTER SERVICES MARKET FORECAST -
MEDICAL SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$140	\$170	23%	\$210	\$260	\$ 320	\$ 400	\$ 490	24%
FACILITIES MANAGEMENT		160	180	13	205	235	265	300	340	14
BATCH		155	168	8	176	191	205	221	237	7
SUBTOTAL PROCESSING		\$455	\$518	14%	\$591	\$686	\$ 790	\$ 921	\$1,067	15%
SOFTWARE PRODUCTS	SYSTEMS	35	49	40	69	95	130	175	235	37
	APPLICA-TIONS	35	46	32	61	81	110	140	180	31
SUBTOTAL SOFTWARE PRODUCTS		\$ 70	\$ 95	36%	\$130	\$176	\$ 240	\$ 315	\$ 415	34%
PROFES-SIONAL SERVICES	SERVICES	100	107	7	115	125	130	140	155	8
	FACILITIES MANAGE-MENT	5	5	7	6	6	7	7	8	10
SUBTOTAL PROFES-SIONAL SERVICES		\$105	\$112	7%	\$121	\$131	\$ 137	\$ 147	\$ 163	8%
GRAND TOTAL		\$630	\$725	15%	\$842	\$993	\$1,167	\$1,383	\$1,645	18%

EXHIBIT B-15

**MARKET FORECAST FOR PROCESSING SERVICES -
EDUCATION SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 18	\$ 20	9%	\$ 21	\$ 24	\$ 26	\$ 28	\$ 31	9%
	INDUSTRY SPECIFIC	8	9	11	10	11	12	14	15	11
	UTILITY	22	24	7	25	27	29	31	34	7
SUBTOTAL		\$ 48	\$ 53	10%	\$ 56	\$ 62	\$ 67	\$ 73	\$ 80	9%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	20	23	17	27	32	38	44	52	18%
	UTILITY		-	-	-	-	-	-	-	-
SUBTOTAL		\$ 20	\$ 23	17%	\$ 27	\$ 32	\$ 38	\$ 44	\$ 52	18%
BATCH	FUNCTION SPECIFIC	15	16	8	17	19	21	22	24	8
	INDUSTRY SPECIFIC	20	22	9	24	26	28	31	34	9
	UTILITY	15	15	0	15	15	15	15	15	0
SUBTOTAL		\$ 50	\$ 53	6%	\$ 56	\$ 60	\$ 64	\$ 68	\$ 73	7%
TOTAL PROCESSING	FUNCTION SPECIFIC	33	36	9	38	43	47	50	55	9
	INDUSTRY SPECIFIC	48	54	13	61	69	78	89	101	13
	UTILITY	37	39	5	40	42	44	46	49	5
GRAND TOTAL		\$118	\$129	9%	\$139	\$154	\$169	\$185	\$205	10%

EXHIBIT B-16

**COMPUTER SERVICES MARKET FORECAST -
EDUCATION SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 48	\$ 53	10%	\$ 56	\$ 62	\$ 67	\$ 73	\$ 80	9%
FACILITIES MANAGEMENT		20	23	17	27	32	38	44	52	18
BATCH		50	53	6	56	60	64	68	73	7
SUBTOTAL PROCESSING		\$118	\$129	9%	\$139	\$154	\$169	\$185	\$205	10%
SOFTWARE PRODUCTS	SYSTEMS	30	35	17	41	47	51	60	70	16
	APPLICATIONS	15	17	12	19	21	24	27	30	12
SUBTOTAL SOFTWARE PRODUCTS		\$ 45	\$ 52	16%	\$ 60	\$ 68	\$ 75	\$ 87	\$100	15%
PROFES- SIONAL SERVICES	SERVICES	85	95	12	105	120	135	150	170	12
	FACILITIES MANAGE- MENT	-	-	-	-	-	-	-	-	-
SUBTOTAL PROFES- SIONAL SERVICES		\$ 85	\$ 95	12%	\$105	\$120	\$135	\$150	\$170	12%
GRAND TOTAL		\$248	\$276	12%	\$304	\$342	\$379	\$422	\$475	12%

EXHIBIT B-17

**MARKET FORECAST FOR PROCESSING SERVICES -
RETAIL SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 30	\$ 38	25%	\$ 47	\$ 59	\$ 74	\$ 92	\$ 115	25%
	INDUSTRY SPECIFIC	250	301	21	361	440	535	646	788	21
	UTILITY	30	36	19	42	51	61	72	87	19
SUBTOTAL		\$310	\$375	21%	\$450	\$550	\$670	\$ 810	\$ 990	21%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	15	18	18	21	25	29	35	41	18
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		\$ 15	\$ 18	18%	\$ 21	\$ 25	\$ 29	\$ 35	\$ 41	18%
BATCH	FUNCTION SPECIFIC	55	63	15	73	84	100	110	130	16
	INDUSTRY SPECIFIC	85	88	3	90	95	95	100	105	4
	UTILITY	30	30	0	30	30	30	30	30	0
SUBTOTAL		\$170	\$181	6%	\$193	\$209	\$225	\$ 240	\$ 265	8%
TOTAL PROCESSING	FUNCTION SPECIFIC	85	101	19	120	143	174	202	245	19
	INDUSTRY SPECIFIC	350	407	16	472	560	659	781	934	18
	UTILITY	60	66	10	72	81	91	102	117	12
GRAND TOTAL		\$495	\$574	16%	\$664	\$784	\$924	\$1,085	\$1,296	18%

EXHIBIT B-18

**COMPUTER SERVICES MARKET FORECAST -
RETAIL SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$310	\$375	21%	\$450	\$ 550	\$ 670	\$ 810	\$ 990	21%
FACILITIES MANAGEMENT		15	18	18	21	25	29	35	41	18
BATCH		170	181	6	193	209	225	240	265	8
SUBTOTAL PROCESSING		\$495	\$574	16%	\$664	\$ 784	\$ 924	\$1,085	\$1,296	18%
SOFTWARE PRODUCTS	SYSTEMS	40	55	38	75	100	140	190	250	36
	APPLICA-TIONS	35	47	35	64	90	115	150	195	33
SUBTOTAL SOFTWARE PRODUCTS		\$ 75	\$102	36%	\$139	\$ 190	\$ 255	\$ 340	\$ 445	34%
PROFES-SIONAL SERVICES	SERVICES	115	135	19	165	195	230	275	330	20
	FACILITIES MANAGE-MENT	-	-	-	-	-	-	-	-	-
SUBTOTAL PROFES-SIONAL SERVICES		\$115	\$135	19%	\$165	\$ 195	\$ 230	\$ 275	\$ 330	20%
GRAND TOTAL		\$685	\$811	19%	\$968	\$1,169	\$1,409	\$1,700	\$2,071	21%

EXHIBIT B-19

**MARKET FORECAST FOR PROCESSING SERVICES -
WHOLESALE SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 52	\$ 58	12%	\$ 70	\$ 80	\$ 90	\$108	\$125	17%
	INDUSTRY SPECIFIC	80	96	20	115	140	170	200	245	21
	UTILITY	22	26	16	30	35	40	47	55	16
SUBTOTAL		\$154	\$180	18%	\$215	\$255	\$300	\$355	\$425	19%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	35	40	13	45	51	58	65	74	13
	UTILITY	5	6	10	6	7	7	8	9	8
SUBTOTAL		\$ 40	\$ 46	15%	\$ 51	\$ 58	\$ 65	\$ 73	\$ 83	13%
BATCH	FUNCTION SPECIFIC	100	110	12	125	140	160	180	200	13
	INDUSTRY SPECIFIC	50	50	0	50	50	50	50	50	0
	UTILITY	95	97	2	99	102	104	106	110	3
SUBTOTAL		\$245	\$257	5%	\$274	\$292	\$314	\$336	\$360	7%
TOTAL PROCESSING	FUNCTION SPECIFIC	152	168	11	195	220	250	288	325	14
	INDUSTRY SPECIFIC	165	186	13	210	241	278	315	369	15
	UTILITY	122	129	6	135	144	151	161	174	6
GRAND TOTAL		\$439	\$483	10%	\$540	\$605	\$679	\$764	\$868	12%

EXHIBIT B-20

**COMPUTER SERVICES MARKET FORECAST -
WHOLESALE SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$154	\$180	18%	\$215	\$255	\$ 300	\$ 355	\$ 425	19%
FACILITIES MANAGEMENT		40	46	15	51	58	65	73	83	13
BATCH		245	257	5	274	292	314	336	360	7
SUBTOTAL PROCESSING		\$439	\$483	10%	\$540	\$605	\$ 679	\$ 764	\$ 868	12%
SOFTWARE PRODUCTS	SYSTEMS	35	49	40	69	95	130	180	240	37
	APPLICA-TIONS	55	73	33	97	130	170	230	300	33
SUBTOTAL SOFTWARE PRODUCTS		\$ 90	\$122	36%	\$166	\$225	\$ 300	\$ 410	\$ 540	35%
PROFES-SIONAL SERVICES	SERVICES	93	110	18	130	155	180	215	255	18
	FACILITIES MANAGE-MENT	2	2	15	3	3	4	4	5	20
SUBTOTAL PROFES-SIONAL SERVICES		\$ 95	\$112	18%	\$133	\$158	\$ 184	\$ 219	\$ 260	18%
GRAND TOTAL		\$624	\$717	15%	\$839	\$988	\$1,163	\$1,393	\$1,668	18%

EXHIBIT B-21

**MARKET FORECAST FOR PROCESSING SERVICES -
FEDERAL GOVERNMENT SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 90	\$105	14%	\$120	\$140	\$165	\$ 190	\$ 220	16%
	INDUSTRY SPECIFIC	25	30	19	37	45	55	67	82	22
	UTILITY	220	260	19	325	400	490	600	750	24
SUBTOTAL		\$335	\$395	18%	\$482	\$585	\$710	\$ 857	\$1,052	22%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	40	43	7	46	50	54	57	60	7
	INDUSTRY SPECIFIC	-	-	-	-	-	-	-	-	-
	UTILITY	60	67	12	78	90	105	120	150	16
SUBTOTAL		\$100	\$110	11%	\$124	\$140	\$159	\$ 177	\$ 210	14%
BATCH	FUNCTION SPECIFIC	9	9	2	9	10	10	10	10	2
	INDUSTRY SPECIFIC	-	-	-	-	-	-	-	-	-
	UTILITY	48	48	0	48	48	48	48	48	0
SUBTOTAL		\$ 57	\$ 57	0%	\$ 57	\$ 58	\$ 58	\$ 58	\$ 58	0%
TOTAL PROCESSING	FUNCTION SPECIFIC	139	157	13	175	200	229	257	290	13
	INDUSTRY SPECIFIC	25	30	20	37	45	55	67	82	22
	UTILITY	328	375	14	451	538	643	768	948	25
GRAND TOTAL		\$492	\$562	14%	\$663	\$783	\$927	\$1,092	\$1,320	23%

EXHIBIT B-22

COMPUTER SERVICES MARKET FORECAST -
FEDERAL GOVERNMENT SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 335	\$ 395	18%	\$ 482	\$ 585	\$ 710	\$ 857	\$1,052	22%
FACILITIES MANAGEMENT		100	110	11	124	140	159	177	210	14
BATCH		57	57	0	57	58	58	58	58	0
SUBTOTAL PROCESSING		\$ 492	\$ 562	14%	\$ 663	\$ 783	\$ 927	\$1,092	\$1,320	23%
SOFTWARE PRODUCTS	SYSTEMS	200	260	30	330	410	510	630	760	25
	APPLICA-TIONS	5	6	20	7	8	9	11	12	15
SUBTOTAL SOFTWARE PRODUCTS		\$ 205	\$ 266	30%	\$ 337	\$ 418	\$ 519	\$ 641	\$ 772	25%
PROFES-SIONAL SERVICES	SERVICES	300	350	16	410	480	550	640	750	16
	FACILITIES MANAGE-MENT	280	300	6	330	360	390	420	460	9
SUBTOTAL PROFES-SIONAL SERVICES		\$ 580	\$ 650	12%	\$ 740	\$ 840	\$ 940	\$1,060	\$1,210	13%
GRAND TOTAL		\$1,277	\$1,478	11%	\$1,740	\$2,041	\$2,386	\$2,793	\$3,302	17%

EXHIBIT B-23

**MARKET FORECAST FOR PROCESSING SERVICES -
STATE AND LOCAL GOVERNMENT SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 17	\$ 21	23%	\$ 26	\$ 32	\$ 39	\$ 47	\$ 57	22%
	INDUSTRY SPECIFIC	8	10	25	13	16	19	24	30	25
	UTILITY	29	35	21	42	51	62	74	89	21
SUBTOTAL		\$ 54	\$ 66	22%	\$ 81	\$ 99	\$120	\$145	\$176	22%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	10	12	23	15	19	23	28	35	24
	UTILITY	30	33	9	36	39	42	45	49	8
SUBTOTAL		\$ 40	\$ 45	13%	\$ 51	\$ 58	\$ 65	\$ 73	\$ 84	13%
BATCH	FUNCTION SPECIFIC	15	16	8	17	19	21	22	24	8
	INDUSTRY SPECIFIC	15	17	16	20	24	27	32	37	17
	UTILITY	40	41	2	42	43	44	45	46	2
SUBTOTAL		\$ 70	\$ 74	6%	\$ 79	\$ 86	\$ 92	\$ 99	\$107	8%
TOTAL PROCESSING	FUNCTION SPECIFIC	32	37	16	43	51	60	69	81	17
	INDUSTRY SPECIFIC	33	39	18	48	59	69	84	102	21
	UTILITY	99	109	10	120	133	148	164	184	11
GRAND TOTAL		\$164	\$185	13%	\$211	\$243	\$277	\$317	\$367	15%

EXHIBIT B-24

**COMPUTER SERVICES MARKET FORECAST -
STATE AND LOCAL GOVERNMENT SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 54	\$ 66	22%	\$ 81	\$ 99	\$ 120	\$ 145	\$ 176	22%
FACILITIES MANAGEMENT		40	45	13	51	58	65	73	84	13
BATCH		70	74	6	79	86	92	99	107	8
SUBTOTAL PROCESSING		\$164	\$185	13%	\$211	\$243	\$ 277	\$ 317	\$ 367	15%
SOFTWARE PRODUCTS	SYSTEMS	77	92	20	110	135	160	195	230	20
	APPLICA-TIONS	15	17	14	19	22	25	29	34	15
SUBTOTAL SOFTWARE PRODUCTS		\$ 92	\$109	18%	\$129	\$157	\$ 185	\$ 224	\$ 264	19%
PROFES-SIONAL SERVICES	SERVICES	325	380	17	445	525	615	720	850	17
	FACILITIES MANAGE-MENT	5	6	20	7	8	9	11	13	17
SUBTOTAL PROFES-SIONAL SERVICES		\$330	\$386	17%	\$452	\$533	\$ 624	\$ 731	\$ 863	17%
GRAND TOTAL		\$586	\$680	16%	\$792	\$933	\$1,086	\$1,272	\$1,494	17%

EXHIBIT B-25

**MARKET FORECAST FOR PROCESSING SERVICES -
SERVICES SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$115	\$132	15%	\$147	\$ 165	\$ 190	\$ 205	\$ 240	13%
	INDUSTRY SPECIFIC	240	300	25	375	475	590	740	930	25
	UTILITY	50	63	25	78	100	125	155	190	25
SUBTOTAL		\$405	\$495	22%	\$600	\$ 740	\$ 905	\$1,100	\$1,360	22%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	5	6	17	7	8	9	11	13	17
	UTILITY	-	-	-	-	-	-	-	-	-
SUBTOTAL		\$ 5	\$ 6	17%	\$ 7	\$ 8	\$ 9	\$ 11	\$ 13	17%
BATCH	FUNCTION SPECIFIC	50	60	18	70	83	98	115	140	18
	INDUSTRY SPECIFIC	145	155	8	170	185	200	215	235	9
	UTILITY	20	20	0	20	20	20	20	20	0
SUBTOTAL		\$215	\$235	9%	\$ 260	\$ 288	\$ 318	\$ 350	\$ 395	11%
TOTAL PROCESSING	FUNCTION SPECIFIC	165	192	16	217	248	288	320	380	15
	INDUSTRY SPECIFIC	390	461	18	552	668	799	966	1,178	21
	UTILITY	70	83	19	98	120	145	175	210	20
GRAND TOTAL		\$625	\$736	18%	\$867	\$1,036	\$1,232	\$1,461	\$1,768	19%

EXHIBIT B-26

COMPUTER SERVICES MARKET FORECAST -
SERVICES SECTOR, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$405	\$495	22%	\$600	\$ 740	\$ 905	\$1,100	\$1,360	22%
FACILITIES MANAGEMENT		5	6	17	7	8	9	11	13	17
BATCH		215	235	9	260	288	318	350	395	11
SUBTOTAL PROCESSING		\$625	\$736	18%	\$867	\$1,036	\$1,232	\$1,461	\$1,768	19%
SOFTWARE PRODUCTS	SYSTEMS	25	33	31	43	57	74	95	125	30
	APPLICA-TIONS	29	36	25	45	57	71	90	115	26
SUBTOTAL SOFTWARE PRODUCTS		\$ 54	\$ 69	28%	\$ 88	\$ 114	\$ 145	\$ 185	\$ 240	28%
PROFES-SIONAL SERVICES	SERVICES	25	30	18	35	41	49	58	69	18
	FACILITIES MANAGE-MENT	-	-	-	-	-	-	-	-	-
SUBTOTAL PROFES-SIONAL SERVICES		\$ 25	\$ 30	18%	\$ 35	\$ 41	\$ 49	\$ 58	\$ 69	18%
GRAND TOTAL		\$704	\$835	19%	\$990	\$1,191	\$1,426	\$1,704	\$2,077	20%

EXHIBIT B-27

**MARKET FORECAST FOR PROCESSING SERVICES -
OTHER SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 40	\$ 47	17%	\$ 55	\$ 65	\$ 76	\$ 90	\$ 105	17%
	INDUSTRY SPECIFIC	140	172	23	205	255	304	365	450	21
	UTILITY	60	71	19	85	100	120	145	175	20
SUBTOTAL		\$240	\$290	20%	\$345	\$420	\$500	\$600	\$ 730	20%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	-	-	-	-	-	-	-	-	-
	INDUSTRY SPECIFIC	10	11	11	12	14	15	17	19	12
	UTILITY	5	6	11	6	7	8	9	10	11
SUBTOTAL		\$ 15	\$ 17	13%	\$ 18	\$ 21	\$ 23	\$ 26	\$ 29	11%
BATCH	FUNCTION SPECIFIC	80	91	14	105	120	135	155	180	15
	INDUSTRY SPECIFIC	94	107	14	125	140	160	185	210	14
	UTILITY	20	21	3	21	22	23	23	24	3
SUBTOTAL		\$194	\$219	13%	\$251	\$282	\$318	\$363	\$ 414	14%
TOTAL PROCESSING	FUNCTION SPECIFIC	120	138	15	160	185	211	245	285	16
	INDUSTRY SPECIFIC	244	290	19	342	409	479	567	679	19
	UTILITY	85	98	15	112	129	151	177	209	16
GRAND TOTAL		\$449	\$526	17%	\$614	\$723	\$841	\$989	\$1,173	17%

EXHIBIT B-28

**COMPUTER SERVICES MARKET FORECAST -
OTHER SECTOR, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$240	\$290	20%	\$345	\$ 420	\$ 500	\$ 600	\$ 730	20%
FACILITIES MANAGEMENT		15	17	13	18	21	23	26	29	11
BATCH		194	219	13	251	282	318	363	414	14
SUBTOTAL PROCESSING		\$449	\$526	17%	\$614	\$ 723	\$ 841	\$ 989	\$1,173	17%
SOFTWARE PRODUCTS	SYSTEMS	19	27	42	36	49	66	90	120	35
	APPLICA-TIONS	26	34	30	44	58	75	100	125	30
SUBTOTAL SOFTWARE PRODUCTS		\$ 45	\$ 61	36%	\$ 80	\$ 107	\$ 141	\$ 190	\$ 245	33%
PROFES-SIONAL SERVICES	SERVICES	127	155	22	190	230	280	350	425	22
	FACILITIES MANAGE-MENT	-	-	-	-	-	-	-	-	-
SUBTOTAL PROFES-SIONAL SERVICES		\$127	\$155	22%	\$190	\$ 230	\$ 280	\$ 350	\$ 425	22%
GRAND TOTAL		\$621	\$742	20%	\$884	\$1,060	\$1,262	\$1,529	\$1,843	21%

EXHIBIT B-29

Computers
 MARKET FORECAST FOR ~~PROCESSING~~ SERVICES -
 TOTAL, 1980-1985

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES	FUNCTION SPECIFIC	\$ 790	\$ 936	19%	\$1,118	\$ 1,342	\$ 1,582	\$ 1,887	\$ 2,273	19%
	INDUSTRY SPECIFIC	1,872	2,313	24	2,836	3,530	4,349	5,362	6,639	23
	UTILITY	866	1,021	18	1,220	1,464	1,761	2,101	2,536	20
SUBTOTAL		\$3,528	\$4,270	21%	\$5,174	\$ 6,336	\$ 7,692	\$ 9,350	\$11,448	22%
FACILITIES MANAGE- MENT	FUNCTION SPECIFIC	49	53	8	58	62	68	72	77	8
	INDUSTRY SPECIFIC	1,034	1,181	14	1,360	1,562	1,788	2,058	2,385	15
	UTILITY	140	158	13	180	205	234	266	315	15
SUBTOTAL		\$1,223	\$1,392	14%	\$1,598	\$ 1,829	\$ 2,090	\$ 2,396	\$ 2,777	15%
BATCH	FUNCTION SPECIFIC	814	895	10	994	1,110	1,235	1,404	1,528	11
	INDUSTRY SPECIFIC	1,239	1,344	9	1,476	1,617	1,798	1,934	2,147	10
	UTILITY	433	443	2	453	468	479	492	508	3
SUBTOTAL		\$2,481	\$2,682	8%	\$2,923	\$ 3,195	\$ 3,512	\$ 3,830	\$ 4,183	9%
TOTAL PROCESSING	FUNCTION SPECIFIC	1,653	1,884	14	2,170	2,514	2,885	3,363	3,878	15
	INDUSTRY SPECIFIC	4,145	4,838	17	5,672	6,709	7,935	9,354	11,171	18
	UTILITY	1,439	1,622	13	1,853	2,137	2,474	2,859	3,359	16
GRAND TOTAL		\$7,237	\$8,344	15%	\$9,695	\$11,360	\$13,294	\$15,576	\$18,408	17%

EXHIBIT B-30

**COMPUTER SERVICES MARKET FORECAST -
TOTAL ~~PROCESSING~~ SERVICES, 1980-1985**

COMPUTER SERVICE		USER EXPENDITURES								
MODE	TYPE	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
REMOTE COMPUTING SERVICES		\$ 3,528	\$ 4,270	21%	\$ 5,174	\$ 6,336	\$ 7,692	\$ 9,350	\$11,448	22%
FACILITIES MANAGEMENT		1,223	1,392	14	1,598	1,829	2,090	2,396	2,777	15
BATCH		2,486	2,682	8	2,923	3,195	~~3,512~~ 3,482	3,830	4,183	9
SUBTOTAL PROCESSING		\$ 7,237	\$ 8,344	15%	\$ 9,695	\$11,360	\$13,264 ^a	\$15,576	\$18,408	17%
SOFTWARE PRODUCTS	SYSTEMS	1,152	1,521	32	1,993	2,593	3,391	4,430	5,735	30
	APPLICATIONS	720	883	23	1,089	1,373	1,697	2,120	2,651	25
SUBTOTAL SOFTWARE PRODUCTS		\$ 1,872	\$ 2,404	28%	\$ 3,082	\$ 3,966	\$ 5,088	\$ 6,550	\$ 8,386	28%
PROFES- SIONAL SERVICES	SERVICES	2,565	3,025	18	3,565	4,231	5,009	5,953	7,134	19
	FACILITIES MANAGE- MENT	367	397	7	439	483	528	575	636	10
SUBTOTAL PROFES- SIONAL SERVICES		\$ 2,932	\$ 3,422	16%	\$ 4,004	\$ 4,714	\$ 5,537	\$ 6,528	\$ 7,770	17%
GRAND TOTAL		\$12,041	\$14,170	18%	\$16,781	\$20,040	\$23,889	\$28,654	\$34,564	20%

APPENDIX C: RECONCILIATION OF MARKET FORECAST
DIFFERENCES, 1979/1980

APPENDIX C: RECONCILIATION OF MARKET FORECAST DIFFERENCES, 1979/1980

A. FORECASTING METHODOLOGY

- INPUT spent a great deal of time in 1980 studying the large vendors in the computer services industry.
 - INPUT compiled the INPUT Directory, the list of the largest computer services companies doing business in the U.S.
 - The 1980 INPUT forecast was tied back to the ADAPSO industry study INPUT conducted.
- The data gathered on the large computer services vendors provided a very detailed picture of revenue generation by mode of delivery:
 - Remote computing.
 - Remote batch.
 - Interactive.
 - Data base.

- Batch.
 - Facilities management.
 - Software products.
 - Professional services.
 - Turnkey systems.
 - Other.
- These data provided the "population" base for the forecast. No sampling procedure was required for this group of companies because all companies were included in the analysis.
 - A sampling procedure was developed to gather statistically reliable information on companies with U.S. available revenues of less than \$10 million in 1979. INPUT's CAMP data base was used to draw a stratified sample of 281 companies.
 - The sample was stratified based on the distribution of companies reported in the 1980 ADAPSO Annual Survey.
 - A detailed analysis of the 281 companies selected was performed in order to establish:
 - The average revenue per company.
 - The distribution of revenue by industry.
 - The distribution of revenue by mode of delivery.

- Using statistics for average revenue per company and the distribution of companies by size, a picture of 1979 revenue generation was constructed.
- The data, based on the sampling procedure, were added to the "population" base figures of larger companies in order to construct a complete industry profile.
- INPUT believes that this procedure will yield results that have a 90% confidence factor of being within 5% of the true value.
- The vendors' revenue production was then converted into an end user expenditure distribution. This conversion was required because INPUT forecasts user expenditures rather than vendor revenues.
- Many computer services companies have acquired marketing rights for software products from developers. Developers generally receive a royalty (percent of the revenues) based on a product's revenues. These royalty payments to developers are not end user expenditures and must be eliminated from the mapping. In the aggregate, these royalties amounted to \$150 million in 1979.
- Processing services firms generally pay 1.4% of their revenue to developers in the form of royalties.
- Software product companies pay an average of 4.0% of their revenue as royalties to package developers.
- The reconciliation between the revenue projections in the 1980 ADAPSO report and those used for this report are shown in Exhibit C-1.
- The INPUT Directory's analysis yielded 18 additional processing services companies and 25 additional professional services companies that have U.S. available revenues of \$10 million or more.

EXHIBIT C-1

RECONCILIATION OF COMPANY DISTRIBUTION BETWEEN 1980 ADAPSO
REPORT AND 1980 INPUT ESTIMATE FOR 1979

COMPANY TYPE/SIZE (\$ MILLION)	NUMBER OF COMPANIES		AVERAGE REVENUE PER COMPANY (\$ MILLION)	
	ADAPSO REPORT	INPUT ESTIMATE*	ADAPSO REPORT	INPUT ESTIMATE*
PROCESSING SERVICES				
< \$2	1,800	1,800	\$ 0.9	\$ 0.9
\$2-10	275	275	4.7	5.0
\$10-25	30	40	15.0	16.0
> \$25	35	43	94.0	78.0
TOTAL	2,140	2,158	\$ 3.1	\$ 3.1
SOFTWARE PRODUCTS				
< \$2	980	980	\$ 0.6	\$ 0.6
\$2-10	100	100	4.2	2.3
> \$10	12	13	17.0	15.0
TOTAL	1,092	1,093	\$ 1.1	\$ 1.0
PROFESSIONAL SERVICES				
< \$2	700	700	\$ 0.4	\$ 0.5
\$2-10	100	100	4.2	4.0
> \$10	10	35	42.0	39.0
TOTAL	810	835	\$ 1.9	\$ 3.2
GRAND TOTAL	4,042	4,086	\$ 2.3	\$ 2.5

*EXCLUDES INTRA-INDUSTRY VENDORS AND COMPUTER MANUFACTURERS

- Processing services revenues from vendors with U.S. available revenues over \$25 million were found to be lower in the population than estimated in the ADAPSO study.
 - The average U.S. available revenue of professional services companies over \$10 million was found to be lower than estimated in the ADAPSO study.
- The stratified samples drawn from companies in the \$2 million to \$10 million range produced only one significant difference.
 - The average software products company generated U.S. available revenue of \$2.3 million rather than the \$4.2 million estimated in the ADAPSO study.
- The ADAPSO study reported total U.S. available revenues from computer services companies. These included revenues generated by these companies from turnkey systems, computer hardware and other sources. These revenues must be substrated from total U.S. available revenues to obtain the actual computer services revenues. For example:
 - Software companies in the \$2 million to \$10 million revenue range generated an average of \$1.5 million from turnkey systems.
 - Professional services companies in the \$2 million to \$10 million revenue range generated an average of \$1.0 million from turnkey systems.
- The reconciliation of the individual revenue components between the ADAPSO report and the INPUT forecast is shown in Exhibit C-2. The random sampling procedure INPUT used yielded the following conclusions:
 - Professional services revenues were understated by nearly \$300 million in the ADAPSO report for processing services companies with U.S. available revenue under \$10 million.

EXHIBIT C-2

RECONCILIATION OF 1979 COMPUTER SERVICES REVENUE COMPONENTS

COMPUTER SERVICE TYPE/COMPANY SIZE (\$ MILLION)	COMPUTER SERVICES REVENUE COMPONENTS (\$ MILLION) **							
	PROCESSING SERVICES		SOFTWARE PRODUCTS		PROFESSIONAL SERVICES		TOTAL COM- PUTER SERVICES	
	ADAPSO	INPUT*	ADAPSO	INPUT*	ADAPSO	INPUT*	ADAPSO	INPUT*
PROCESSING SERVICES < \$2 \$2-10 \$10-25 >\$25	\$1,400 1,140 430 2,900	\$1,420 1,150 530 2,950	\$ 70 30 0 100	\$ 50 20 60 120	\$ 130 40 0 130	\$ 240 210 40 280	\$1,600 1,210 430 3,130	\$ 1,710 1,380 630 3,350
TOTAL	\$5,870	\$6,050	\$ 200	\$ 250	\$ 300	\$ 770	\$6,370	\$ 7,070
SOFTWARE PRODUCTS <\$2 \$2-10 >\$10	\$ 20 0 0	\$ 10 30 10	\$ 390 310 200	\$ 430 150 180	\$ 30 30 20	\$ 100 50 10	\$ 440 340 220	\$ 540 230 200
TOTAL	\$ 20	\$ 50	\$ 900	\$ 760	\$ 80	\$ 160	\$1,000	\$ 970
PROFESSIONAL SERVICES >\$2 \$2-10 <\$10	\$ 20 40 230	\$ 60 40 200	\$ 40 10 20	\$ 30 10 30	\$ 240 360 510	\$ 260 350 1,130	\$ 300 410 760	\$ 350 400 1,360
TOTAL	\$ 290	\$ 300	\$ 70	\$ 70	\$1,110	\$1,740	\$1,470	\$ 2,110
GRAND TOTAL	\$6,180	\$6,400	\$1,170	\$1,080	\$1,490	\$2,670	\$8,840	\$10,150

*EXCLUDES INTRA-INDUSTRY AND COMPUTER MANUFACTURER REVENUE.

**THE REVENUE COMPONENTS ARE NET OF ANY THIRD-PARTY PAYMENTS AND ARE THEREFORE EQUIVALENT TO END USER EXPENDITURES.

- Software product revenues from companies with U.S. available revenue between \$2 million and \$10 million was overstated by \$160 million in the ADAPSO study.

B. OVERALL MARKET

- There are two major types of end user expenditures that are included in the INPUT forecasts, but excluded from the ADAPSO report.
 - End users buying computer services from firms in their own industry are not considered in the ADAPSO study. These expenditures exceeded \$800 million in 1979, as shown in Exhibit C-3.
 - End users' expenditures to computer manufacturers for software products and professional services are also excluded from the ADAPSO survey. These expenditures exceeded \$1 billion in 1979, as shown in Exhibit C-4.
- The reconciliation of 1979 computer services expenditures between the 1979 and 1980 INPUT Annual Reports is shown in Exhibit C-5.
 - Remote computing expenditures for on-line data base services were found to be \$350 million higher in 1979 than was expected last year. Further detail is reported in INPUT's study on on-line data base services.
 - Additional facilities management processing services expenditures were identified in 1980. These expenditures amounted to nearly \$200 million in 1979, rather evenly divided across all industry sectors.
 - Approximately \$150 million was added to industry-specialized batch processing mainly to reflect seismic data processing expenditures that had been understated in previous forecasts.

EXHIBIT C-3

DISTRIBUTION OF 1979 END USER EXPENDITURES FOR INTRA-INDUSTRY PROCESSING SERVICES

PROCESSING SERVICES VENDOR SIZE (\$ MILLION)	NUMBER OF VENDORS	END USER EXPENDITURES (\$ MILLION)
< \$2	120	\$150
\$2-10	140	403
> \$10	20	280
TOTAL	280	\$833

INDUSTRY SECTOR SERVED	END USER EXPENDITURES (\$ MILLION)
BANKING AND FINANCE	\$775
INSURANCE	33
TRANSPORTATION	25
TOTAL	\$833

EXHIBIT C-4

DISTRIBUTION OF COMPUTER MANUFACTURERS' 1979
SOFTWARE PRODUCT AND PROFESSIONAL SERVICES REVENUES

COMPUTER SERVICES REVENUES (\$ MILLION)	SOFTWARE PRODUCT REVENUES (\$ MILLION)	PROFESSIONAL SERVICES REVENUES (\$ MILLION)	TOTAL REVENUES (\$ MILLION)
< \$2	\$ 20	\$100	\$ 120
\$2-10	35	20	55
>\$10	731	140	871
TOTAL	\$786	\$260	\$1,046

EXHIBIT C-5

RECONCILIATION OF 1979 COMPUTER SERVICES FORECASTS (BY MODE OF DELIVERY) BETWEEN 1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE	1979 FORECAST OF THE 1979 MARKET (\$ MILLION)	1980 REPORT OF THE 1979 MARKET (\$ MILLION)
PROCESSING SERVICES		
REMOTE COMPUTING	\$ 3,183	\$ 3,530
FACILITIES MANAGEMENT	1,025	1,220
BATCH	2,371	2,480
TOTAL PROCESSING SERVICES	\$ 6,579	\$ 7,230
SOFTWARE PRODUCTS		
SYSTEMS	\$ 976	\$ 1,150
APPLICATIONS	724	720
TOTAL SOFTWARE PRODUCTS	\$ 1,700	\$ 1,870
PROFESSIONAL SERVICES		
SERVICES	\$ 1,621	\$ 2,560
FACILITIES MANAGEMENT	292	370
TOTAL PROFESSIONAL SERVICES	\$ 1,913	\$ 2,930
GRAND TOTAL COMPUTER SERVICES	\$10,192	\$12,030

- Approximately \$170 million was added to the systems software market to reflect the minicomputer manufacturers' involvement in the computer services market. These revenues were understated in last year's forecast.
- One billion dollars in professional services expenditures were added to market size based on the analysis of the INPUT Directory and the stratified random sampling procedure discussed above.
 - . Over \$900 million was identified in standard processing services contracts. These expenditures were found to have been understated across all industry sectors.
 - . Nearly \$80 million in professional services facilities management expenditures was understated last year. These expenditures were identified in almost all industry sectors except the federal government.
- The reconciliation of average annual growth rates by mode of delivery between the 1979 and 1980 Annual Reports is shown in Exhibit C-6.
 - The overall growth rate for remote computing services has been increased to reflect the tremendous growth in data base services.
 - The batch growth rate increase reflects increased activity in seismic data processing, among other areas.
 - Professional services facilities management growth will barely keep pace with inflation.
- Processing services expenditures by EDP managers and end users were estimated based on INPUT's EDP User Panel and other INPUT studies.

EXHIBIT C-6

RECONCILIATION OF COMPUTER SERVICES FORECASTS FOR AVERAGE ANNUAL GROWTH RATES (BY MODE OF DELIVERY) BETWEEN 1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE	1979 AAGR FOR NEXT FIVE YEARS (PERCENT)	1980 AAGR FOR NEXT FIVE YEARS (PERCENT)
PROCESSING SERVICES		
REMOTE COMPUTING	21%	22%
FACILITIES MANAGEMENT	15	15
BATCH	8	9
TOTAL PROCESSING SERVICES	16%	17%
SOFTWARE PRODUCTS		
SYSTEMS	32%	30%
APPLICATIONS	24	25
TOTAL SOFTWARE PRODUCTS	29%	28%
PROFESSIONAL SERVICES		
SERVICES	19%	19%
FACILITIES MANAGEMENT	13	10
TOTAL PROFESSIONAL SERVICES	18%	17%
GRAND TOTAL COMPUTER SERVICES	19%	20%

- There were 7,500 sites where EDP organizations spent an average of \$85,000 on processing services in 1979. In addition to the expenditures made by EDP organizations, end users spent an average of \$170,000 per site last year.
- There were 1,250 sites where EDP organizations spent an average of \$24,000 on processing services in 1979. In addition to the expenditures made by EDP organizations, end users spent an average of \$52,000 per site last year.
- There were an additional 100,000 end users that spent an average of \$38,000 per end user in 1979.
 - . Approximately 20,000 end users spent an average of \$90,000 each.
 - . Another 75,000 end users spent only \$25,000 on average per user.
- A summary of EDP organization and end user expenditures is shown in Exhibit C-7. It should be noted that processing services expenditures reflect INPUT's market forecast of \$6.0 billion for remote computing and batch services, as shown in Exhibit C-5.
- Software product expenditures of EDP organizations have been estimated as shown in Exhibit C-8. These figures tie in extremely closely with INPUT's projections shown in Exhibit C-5.
- Estimated professional services expenditures are shown in Exhibit C-9.
 - The federal government sector has been separated from other industry sectors because of the rather unique aspects of the sector.
 - There were 7,500 EDP organizations that spent an average of \$100,000 each on professional services in 1979.

EXHIBIT C-7

1979 PROCESSING SERVICES EXPENDITURE
DISTRIBUTION, BY TYPE OF USER

TYPE OF PROCESSING SERVICES USER	TOTAL 1979 EXPENDITURES (\$ MILLION)
EDP ORGANIZATION	\$ 940
END USER	5,120
TOTAL	\$6,060

EXHIBIT C-8

EDP ORGANIZATION SOFTWARE PRODUCT
EXPENDITURES IN 1979

SIZE OF COMPUTER SITE	NUMBER OF SITES	AVERAGE AMOUNT SPENT PER SITE ON SOFTWARE PRODUCTS	TOTAL SOFTWARE PRODUCT EXPENDITURES (\$ MILLION)
LARGE	7,500	\$126,000	\$ 945
MEDIUM	12,500	36,000	450
SMALL	450,000	1,000	450
VERY SMALL	370,000	25	9
TOTAL	840,000	-	\$1,854

EXHIBIT C-9

1979 PROFESSIONAL SERVICES EXPENDITURE DISTRIBUTION,
BY TYPE OF USER

TYPE OF USER	TOTAL 1979 EXPENDITURES (\$ MILLION)
EDP ORGANIZATION	\$1,250
END USERS	1,000
FEDERAL GOVERNMENT	300
TOTAL	\$2,550

- There were an additional 12,500 EDP organizations that spent an average of \$40,000 each in 1979.
 - Over 100,000 end users spent an average of \$10,000 in 1979 on professional services.
 - The total estimated expenditures balance with INPUT's forecast shown in Exhibit C-5.
- An analysis of the federal government statistics on employment in the computer services industry was performed as an additional check to verify INPUT's market forecast.
 - A regression analysis was performed on computer services companies' payroll records to determine the number of employees in the industry.
 - The payroll records do not include computer services personnel working for companies not classified as computer services companies. Computer manufacturers, turnkey systems vendors and companies such as Dun & Bradstreet, Mead, etc., are not classified by the government as computer services vendors.
 - There were approximately 288,000 personnel working for firms classified by the government as computer services vendors in 1979. In addition, there are 20,000-50,000 computer services personnel working for companies not classified by the government as computer services firms.
 - An average revenue per employee of \$40,000, with 308,000 to 338,000 personnel in the industry, yields an expected market size of \$12.3-13.5 billion. INPUT's forecast is at the lower end of this range.
 - The average annual growth rates by industry sector have remained essentially unchanged, as shown in Exhibit C-10. The remaining sections of this appendix reconcile changes made in the individual industry sectors.

EXHIBIT C-10

RECONCILIATION OF COMPUTER SERVICES FORECASTS BY INDUSTRY SECTOR BETWEEN 1979 AND 1980 ANNUAL REPORTS

INDUSTRY SECTOR	1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
DISCRETE MANUFACTURING	\$ 1,351	\$ 1,707	\$ 4,390	\$ 5,920	22%	24%
PROCESS MANUFACTURING	761	1,010	2,760	3,680	24	25
TRANSPORTATION	253	286	920	1,066	24	25
UTILITIES	396	525	1,080	1,469	18	19
BANKING AND FINANCE	1,907	2,010	4,600	5,196	16	18
INSURANCE	978	1,128	2,140	2,658	14	16
MEDICAL	570	630	1,460	1,645	17	18
EDUCATION	192	248	450	475	15	12
RETAIL	634	685	2,000	2,071	21	21
WHOLESALE	575	624	1,710	1,668	20	18
FEDERAL GOVERNMENT	1,279	1,277	3,760	3,302	20	15
STATE AND LOCAL GOVERNMENT	378	586	1,040	1,494	18	17
SERVICES	498	704	1,270	2,077	17	20
OTHER	420	621	1,280	1,843	20	21
TOTAL	\$10,192	\$12,041	\$28,860	\$34,564	19%	20%

- Virtually all industry sectors have a higher level of professional services expenditures. This point has been addressed earlier and will not be commented on for individual industry sectors.

C. DISCRETE MANUFACTURING

- The overall growth rate for the discrete manufacturing sector was increased by two percentage points to reflect the growing potential and use of on-line data base services and CAD/CAM services, as shown in Exhibit C-11. These elements are particularly strong for industry-specialized RCS.
- CAD/CAM services will be much more important in discrete manufacturing than in process manufacturing over the next five years. The difference in growth rates in industry-specialized RCS between these industries reflects the higher CAD/CAM usage in discrete manufacturing.
- Turnkey systems continue to have a negative impact on function specific facilities management and batch services. The five-year growth rate for this area was lowered to reflect this negative impact.
- Expenditures for systems software were raised to reflect the adjustment made for minicomputers in this year's forecast.

D. PROCESS MANUFACTURING

- The function specific growth rate for RCS in the process manufacturing sector has been raised to reflect revised levels of scientific and engineering processing activity, which are higher than previously forecast.

EXHIBIT C-11

RECONCILIATION OF COMPUTER SERVICES FORECASTS
IN DISCRETE MANUFACTURING BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 114	\$ 110	\$ 340	\$ 335	20%	21%
	INDUSTRY SPEC.	161	246	510	1,035	21	27
	UTILITY	82	76	220	210	18	19
SUBTOTAL		\$ 357	\$ 432	\$1,070	\$1,580	20%	24%
FACILITIES MANAGEMENT	FUNCTION SPEC.	5	5	14	10	19	11
	INDUSTRY SPEC.	31	31	94	86	20	18
	UTILITY	24	24	62	62	17	17
SUBTOTAL		\$ 60	\$ 60	\$ 170	\$ 158	19%	17%
BATCH	FUNCTION SPEC.	213	210	440	320	13	7
	INDUSTRY SPEC.	69	60	110	115	8	12
	UTILITY	53	60	62	87	3	6
SUBTOTAL		\$ 335	\$ 330	\$ 612	\$ 522	10%	8%
TOTAL PROCESSING	FUNCTION SPEC.	332	325	794	665	16	13
	INDUSTRY SPEC.	261	337	714	1,236	18	24
	UTILITY	159	160	344	359	14	15
TOTAL		\$ 752	\$ 822	\$1,852	\$2,260	16%	19%
SOFTWARE PRODUCTS	SYSTEMS	227	280	1,240	1,420	33	31
	APPLICATIONS	119	110	550	510	29	29
TOTAL		\$ 346	\$ 390	\$1,790	\$1,930	31%	31%
PROFESSIONAL SERVICES		253	495	780	1,730	21	23
GRAND TOTAL		\$1,351	\$1,707	\$4,422	\$5,920	22%	24%

- A shift of expenditures from industry-specialized RCS to batch was made in order to reflect the nature of much of the seismic data processing activity.
- Industry-specialized batch processing continues to grow rapidly due to seismic data processing and other activities related to oil and gas exploration, as shown in Exhibit C-12.
- Utility RCS was reevaluated this year, with corresponding changes made to the size of the expenditures and growth rate through 1985.
- The entire industry sector reflects strong growth due to continued energy-related computer services activities.
- Software product and professional services growth rates will begin to level out as the market bases get larger.
- Turnkey systems are not expected to have a major impact on function specific processing. Such systems are generally not adequate for the large process manufacturing companies.

E. TRANSPORTATION

- As Exhibit C-13 shows, there are only minor changes to growth rates in the transportation sector.
 - Some general business expenditures were shifted from batch to RCS. These expenditure flows have a low growth rate, which affected the forecast.
 - The rate of growth in systems software expenditures will begin to level off from its previously projected 40% rate as the base grows larger.

EXHIBIT C-12

RECONCILIATION OF COMPUTER SERVICES FORECASTS
IN PROCESS MANUFACTURING BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE							
MODE	TYPE	1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 76	\$ 90	\$ 230	\$ 400	20%	28%
	INDUSTRY SPEC.	98	35	330	120	22	23
	UTILITY	94	165	230	550	16	22
SUBTOTAL		\$268	\$ 290	\$ 790	\$1,070	20%	24%
FACILITIES MANAGEMENT	FUNCTION SPEC.	2	2	5	5	15	20
	INDUSTRY SPEC.	32	33	82	86	17	17
	UTILITY	5	5	14	14	19	19
SUBTOTAL		\$ 39	\$ 40	\$ 101	\$ 105	17%	17%
BATCH	FUNCTION SPEC.	70	65	110	130	8	12
	INDUSTRY SPEC.	30	100	56	335	11	22
	UTILITY	37	45	44	55	3	4
SUBTOTAL		\$137	\$ 210	\$ 210	\$ 520	7%	17%
TOTAL PROCESSING	FUNCTION SPEC.	148	157	345	535	15	23
	INDUSTRY SPEC.	160	168	468	541	19	22
	UTILITY	136	215	288	619	13	20
TOTAL		\$444	\$ 540	\$1,101	\$1,695	16%	21%
SOFTWARE PRODUCTS	SYSTEMS	142	160	990	970	38	35
	APPLICATIONS	38	40	250	205	37	32
TOTAL		\$180	\$ 200	\$1,240	\$1,175	38%	35%
PROFESSIONAL SERVICES		137	270	470	810	23	20
GRAND TOTAL		\$761	\$1,010	\$2,811	\$3,680	24%	25%

EXHIBIT C-13

RECONCILIATION OF COMPUTER SERVICES FORECASTS
IN TRANSPORTATION BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 14	\$ 20	\$ 39	\$ 42	19%	13%
	INDUSTRY SPEC.	50	40	190	155	25	25
	UTILITY	27	20	59	43	14	13
SUBTOTAL		\$ 91	\$ 80	\$288	\$ 240	21%	20%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	30	30	56	57	11	12
	UTILITY	-	-	-	-	-	-
SUBTOTAL		\$ 30	\$ 30	\$ 56	\$ 57	11%	12%
BATCH	FUNCTION SPEC.	20	15	33	26	8	10
	INDUSTRY SPEC.	18	20	33	38	11	12
	UTILITY	7	10	7	10	0	0
SUBTOTAL		\$ 45	\$ 45	\$ 73	\$ 74	8%	9%
TOTAL PROCESSING	FUNCTION SPEC.	34	35	72	68	13	12
	INDUSTRY SPEC.	98	90	279	250	19	19
	UTILITY	34	30	66	53	12	10
TOTAL		\$166	\$155	\$417	\$ 371	16%	16%
SOFTWARE PRODUCTS	SYSTEMS	34	46	260	290	40	36
	APPLICATIONS	20	20	120	125	35	36
TOTAL		\$ 54	\$ 66	\$380	\$ 415	38%	36%
PROFESSIONAL SERVICES		33	65	150	280	28	28
GRAND TOTAL		\$253	\$286	\$947	\$1,066	24%	25%

F. UTILITIES

- The only significant change in growth rates in the utilities sector was in applications software products. Utilities are tending towards customized solutions over packaged solutions, as Exhibit C-14 shows.
- Turnkey systems are not expected to have a significant impact on function specific processing, as was anticipated last year. The growth rate was raised to reflect the change in expectations.
- The utility FM area was reexamined, slightly enlarged, but found to be growing more slowly than originally forecast.

G. BANKING AND FINANCE

- The growth rate for systems software products in the banking and finance sector was raised to reflect controlled unbundling by computer manufacturers. This is shown in Exhibit C-15.
- General business RCS was found to be a slightly smaller market, growing more slowly than was previously forecast.
- Batch utility processing, a very small portion of the entire industry, was found to be growing faster than originally expected.

H. INSURANCE

- As shown in Exhibit C-16, the growth rate for systems software products in the insurance sector was raised to reflect continued unbundling by computer

EXHIBIT C-14

RECONCILIATION OF COMPUTER SERVICES FORECASTS
IN UTILITIES BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 63	\$ 60	\$ 150	\$ 185	16%	21%
	INDUSTRY SPEC.	53	70	185	245	23	23
	UTILITY	86	100	160	200	11	12
SUBTOTAL		\$202	\$230	\$ 495	\$ 630	16%	19%
FACILITIES MANAGEMENT	FUNCTION SPEC.	2	2	2	2	0	0
	INDUSTRY SPEC.	-	2	-	2	-	0
	UTILITY	6	11	13	21	17	12
SUBTOTAL		\$ 8	\$ 15	\$ 15	\$ 25	13%	9%
BATCH	FUNCTION SPEC.	29	30	35	48	3	9
	INDUSTRY SPEC.	10	10	12	13	4	3
	UTILITY	15	20	15	20	0	0
SUBTOTAL		\$ 54	\$ 60	\$ 62	\$ 81	2%	3%
TOTAL PROCESSING	FUNCTION SPEC.	94	92	187	235	12	17
	INDUSTRY SPEC.	63	82	197	260	21	22
	UTILITY	107	131	188	241	10	11
TOTAL		\$264	\$305	\$ 572	\$ 736	14%	16%
SOFTWARE PRODUCTS	SYSTEMS	41	55	230	295	33	32
	APPLICATIONS	13	15	90	45	38	20
TOTAL		\$ 54	\$ 70	\$ 320	\$ 340	35%	30%
PROFESSIONAL SERVICES		78	150	210	393	18	17
GRAND TOTAL		\$396	\$525	\$1,102	\$1,469	18%	19%

EXHIBIT C-15

RECONCILIATION OF COMPUTER SERVICES FORECASTS
IN BANKING AND FINANCE BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 105	\$ 70	\$ 320	\$ 205	21%	18%
	INDUSTRY SPEC.	540	540	1,850	1,900	23	23
	UTILITY	44	45	93	95	13	13
SUBTOTAL		\$ 689	\$ 655	\$2,263	\$2,200	22%	22%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	233	255	600	670	17	17
	UTILITY	-	-	-	-	-	-
SUBTOTAL		\$ 233	\$ 255	\$ 600	\$ 670	17%	17%
BATCH	FUNCTION SPEC.	134	130	220	220	9	10
	INDUSTRY SPEC.	468	450	700	690	7	8
	UTILITY	7	10	14	19	11	14
SUBTOTAL		\$ 609	\$ 590	\$ 934	\$ 929	8%	8%
TOTAL PROCESSING	FUNCTION SPEC.	239	200	540	425	15	14
	INDUSTRY SPEC.	1,241	1,245	3,150	3,260	16	18
	UTILITY	51	55	107	114	13	13
TOTAL		\$1,531	\$1,500	\$3,797	\$3,799	16%	17%
SOFTWARE PRODUCTS	SYSTEMS	62	70	130	340	14	30
	APPLICATIONS	187	190	410	470	14	16
TOTAL		\$ 249	\$ 260	\$ 540	\$ 810	14%	22%
PROFESSIONAL SERVICES		127	250	290	587	15	15
GRAND TOTAL		\$1,907	\$2,010	\$4,627	\$5,196	16%	18%

EXHIBIT C-16

RECONCILIATION OF COMPUTER SERVICES FORECASTS
IN INSURANCE BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 74	\$ 65	\$ 190	\$ 167	17%	17%
	INDUSTRY SPEC.	75	70	240	220	21	21
	UTILITY	20	20	37	38	11	11
SUBTOTAL		\$169	\$ 155	\$ 467	\$ 425	18%	18%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	411	428	870	910	13	14
	UTILITY	-	-	-	-	-	-
SUBTOTAL		\$411	\$ 428	\$ 870	\$ 910	13%	14%
BATCH	FUNCTION SPEC.	22	20	31	29	6	7
	INDUSTRY SPEC.	58	65	92	105	8	8
	UTILITY	9	10	14	14	6	5
SUBTOTAL		\$ 89	\$ 95	\$ 137	\$ 148	7%	8%
TOTAL PROCESSING	FUNCTION SPEC.	96	85	221	196	15	15
	INDUSTRY SPEC.	544	563	1,202	1,235	14	14
	UTILITY	29	30	51	52	11	10
TOTAL		\$669	\$ 678	\$1,474	\$1,483	14%	14%
SOFTWARE PRODUCTS	SYSTEMS	58	80	140	390	15	30
	APPLICATIONS	128	130	290	305	15	15
TOTAL		\$186	\$ 210	\$ 430	\$ 695	15%	22%
PROFESSIONAL SERVICES		123	240	250	480	12	12
GRAND TOTAL		\$978	\$1,128	\$2,154	\$2,658	14%	16%

manufacturers. In addition, the size of the market was raised to reflect last year's conservative estimate of the expenditures made for minicomputer systems software.

I. MEDICAL

- The overall processing services category in the medical sector remains essentially unchanged, as shown in Exhibit C-17. However, there were minor changes in the individual categories, reflecting new data obtained this year.
- Scientific and engineering batch services were found to be growing faster than expected last year, which increased the function specific batch processing growth rate.
- The overall rate of growth in systems software products has been reduced to reflect the maturity of the installed computer base in this market segment.

J. EDUCATION

- Growth rates have been trimmed in the education sector because pressures persist for expense reductions. Exhibit C-18 shows the three percentage-point overall decline.

K. RETAIL

- No significant changes have been made to the retail sector forecast, as shown in Exhibit C-19. However, two growth rates were changed to reflect better information collected this year.

EXHIBIT C-17

RECONCILIATION OF COMPUTER SERVICES FORECASTS
IN MEDICAL BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 13	\$ 13	\$ 43	\$ 46	22%	24%
	INDUSTRY SPEC.	138	120	470	424	23	24
	UTILITY	7	7	20	20	19	20
SUBTOTAL		\$158	\$140	\$ 533	\$ 490	22%	24%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	154	160	330	340	13	14
	UTILITY	-	-	-	-	-	-
SUBTOTAL		\$154	\$160	\$ 330	\$ 340	13%	14%
BATCH	FUNCTION SPEC.	18	20	24	47	5	15
	INDUSTRY SPEC.	128	125	190	180	6	6
	UTILITY	7	10	7	10	0	0
SUBTOTAL		\$153	\$155	\$ 221	\$ 237	6%	7%
TOTAL PROCESSING	FUNCTION SPEC.	31	33	67	93	14	19
	INDUSTRY SPEC.	420	405	990	944	15	15
	UTILITY	14	17	27	30	11	11
TOTAL		\$465	\$455	\$1,084	\$1,067	15%	16%
SOFTWARE PRODUCTS	SYSTEMS	24	35	180	235	40	37
	APPLICATIONS	27	35	140	180	32	31
TOTAL		\$ 51	\$ 70	\$ 320	\$ 415	36%	34%
PROFESSIONAL SERVICES		54	105	86	163	8	8
GRAND TOTAL		\$570	\$630	\$1,490	\$1,645	17%	18%

EXHIBIT C-18

RECONCILIATION OF COMPUTER SERVICES
FORECASTS IN EDUCATION BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 18	\$ 18	\$ 41	\$ 31	15%	9%
	INDUSTRY SPEC.	8	8	25	15	21	11
	UTILITY	18	22	27	34	7	7
SUBTOTAL		\$ 44	\$ 48	\$ 93	\$ 80	13%	9%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	20	20	50	52	17	18
	UTILITY	-	-	-	-	-	-
SUBTOTAL		\$ 20	\$ 20	\$ 50	\$ 52	17%	18%
BATCH	FUNCTION SPEC.	11	15	16	24	7	9
	INDUSTRY SPEC.	19	20	32	34	9	9
	UTILITY	9	15	9	15	0	0
SUBTOTAL		\$ 39	\$ 50	\$ 57	\$ 73	6%	7%
TOTAL PROCESSING	FUNCTION SPEC.	29	33	57	55	12	9
	INDUSTRY SPEC.	47	48	107	101	15	13
	UTILITY	27	37	36	49	5	5
TOTAL		\$103	\$118	\$200	\$205	12%	10%
SOFTWARE PRODUCTS	SYSTEMS	35	30	130	70	25	16
	APPLICATIONS	11	15	28	30	17	12
TOTAL		\$ 46	\$ 45	\$158	\$100	23%	15%
PROFESSIONAL SERVICES		43	85	96	170	14	12
GRAND TOTAL		\$192	\$248	\$454	\$475	15%	12%

EXHIBIT C-19

RECONCILIATION OF COMPUTER SERVICES
FORECASTS IN RETAIL BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 27	\$ 30	\$ 79	\$ 115	25%	25%
	INDUSTRY SPEC.	272	250	850	788	21	21
	UTILITY	30	30	86	87	19	19
SUBTOTAL		\$ 329	\$ 310	\$ 1,015	\$ 990	21%	21%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	6	15	17	41	18	18
	UTILITY	-	-	-	-	-	-
SUBTOTAL		\$ 6	\$ 15	\$ 17	\$ 41	18%	18%
BATCH	FUNCTION SPEC.	68	55	160	130	15	16
	INDUSTRY SPEC.	77	85	80	105	1	14
	UTILITY	26	30	26	30	0	0
SUBTOTAL		\$ 171	\$ 170	\$ 266	\$ 265	7%	8%
TOTAL PROCESSING	FUNCTION SPEC.	95	85	239	245	16	20
	INDUSTRY SPEC.	355	350	947	934	18	18
	UTILITY	56	60	112	117	12	12
TOTAL		\$ 506	\$ 495	\$ 1,298	\$ 1,296	17%	18%
SOFTWARE PRODUCTS	SYSTEMS	35	40	400	250	50	36
	APPLICATIONS	34	35	200	195	34	33
TOTAL		\$ 69	\$ 75	\$ 600	\$ 445	43%	34%
PROFESSIONAL SERVICES		59	115	170	330	19	20
GRAND TOTAL		\$ 634	\$ 685	\$ 2,068	\$ 2,071	21%	21%

- Industry specific batch processing has not been adversely affected by turnkey systems or RCS, as was initially expected. The growth rate has therefore been revised upward.
- The growth rate for systems software was lowered to reflect the large installed equipment base.

L. WHOLESALE

- The growth for systems software has been lowered, as shown in Exhibit C-20, to reflect the large base of installed equipment.
- Turnkey systems appear to be having a negative effect on both function specific RCS and batch services. Five-year growth rates in these areas were therefore lowered.
- The batch utility segment was reexamined, with minor changes made to reflect the new data obtained.

M. FEDERAL GOVERNMENT

- There continues to be pressure to reduce expenditures in the federal government. Nonclassified computer services expenditures could be negatively affected by this trend. In balance, the shortage of available people will force outside contracting.
- Processing services facilities management was moved to professional services facilities management last year to reflect the predominant use of that mode of delivery. However, further analysis in 1980 revealed that approximately

EXHIBIT C-20

RECONCILIATION OF COMPUTER SERVICES
FORECASTS IN WHOLESALE BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 62	\$ 52	\$ 180	\$ 125	20%	17%
	INDUSTRY SPEC.	90	80	270	245	20	21
	UTILITY	22	22	55	55	16	16
SUBTOTAL		\$174	\$154	\$ 505	\$ 425	20%	19%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	33	35	69	74	13	13
	UTILITY	5	5	9	9	10	9
SUBTOTAL		\$ 38	\$ 40	\$ 78	\$ 83	13%	13%
BATCH	FUNCTION SPEC.	113	100	260	200	15	13
	INDUSTRY SPEC.	34	50	36	50	1	0
	UTILITY	85	95	97	110	2	8
SUBTOTAL		\$232	\$245	\$ 393	\$ 360	9%	7%
TOTAL PROCESSING	FUNCTION SPEC.	175	152	440	325	17	14
	INDUSTRY SPEC.	157	165	375	369	14	15
	UTILITY	112	122	161	174	7	6
TOTAL		\$444	\$439	\$ 976	\$ 868	11%	12%
SOFTWARE PRODUCTS	SYSTEMS	24	35	340	240	56	37
	APPLICATIONS	58	55	320	300	33	27
TOTAL		\$ 82	\$ 90	\$ 660	\$ 540	41%	35%
PROFESSIONAL SERVICES		49	95	130	260	18	18
GRAND TOTAL		\$575	\$624	\$1,766	\$1,668	20%	18%

\$100 million of processing services FM exists in addition to the nearly \$300 million of professional services FM.

- RCS utility expenditures were found to be slightly higher than originally expected, but the growth rate was lowered to reflect the impact that minicomputer purchases will have on this market segment, as shown in Exhibit C-21.
- Similarly, the growth rate of function specific batch services was lowered due to the expected impact of minicomputer purchases on this segment.
- Although major military contracts for base-level computers in the Army and Air Force will have a major impact on services expenditures, they have been excluded from this analysis.

N. STATE AND LOCAL GOVERNMENT

- State and local governments will continue to feel the pressure of expense reductions similar to the situation caused by Proposition 13 in California. This will provide opportunities for computer services companies that can demonstrate cost effective services.
- As Exhibit C-22 shows, RCS and batch growth prospects have been trimmed in this year's forecast.
- Although the processing services' FM growth rate dropped, the market was found to be larger than originally forecast.
- Professional services, delivered as standard services as well as FM, represent a good opportunity through 1985.

EXHIBIT C-21

RECONCILIATION OF COMPUTER SERVICES
FORECASTS IN FEDERAL GOVERNMENT BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 82	\$ 90	\$ 190	\$ 220	15%	16%
	INDUSTRY SPEC.	21	25	73	82	23	22
	UTILITY	197	220	770	750	26	24
SUBTOTAL		\$ 300	\$ 335	\$1,033	\$1,052	23%	22%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	40	-	60	-	7
	INDUSTRY SPEC.	-	-	-	-	-	-
	UTILITY	-	60	-	150	-	16
SUBTOTAL		-	\$ 100	-	\$ 210	-	14%
BATCH	FUNCTION SPEC.	9	9	16	10	9	2
	INDUSTRY SPEC.	-	-	-	-	-	-
	UTILITY	48	48	48	48	0	0
SUBTOTAL		\$ 57	\$ 57	\$ 64	\$ 58	2%	2%
TOTAL PROCESSING	FUNCTION SPEC.	91	139	206	290	15	13
	INDUSTRY SPEC.	21	25	73	82	23	22
	UTILITY	245	328	818	948	22	25
TOTAL		\$ 357	\$ 492	\$1,097	\$1,320	20%	23%
SOFTWARE PRODUCTS	SYSTEMS	204	200	780	760	25	25
	APPLICATIONS	19	5	44	12	15	15
TOTAL		\$ 223	\$ 205	\$ 824	\$ 772	24%	25%
PROFESSIONAL SERVICES		699	580	1,850	1,210	11	13
GRAND TOTAL		\$1,279	\$1,277	\$3,771	\$3,302	20%	17%

EXHIBIT C-22

RECONCILIATION OF COMPUTER SERVICES
FORECASTS IN STATE AND LOCAL GOVERNMENT BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 17	\$ 17	\$ 102	\$ 57	35%	22%
	INDUSTRY SPEC.	8	8	49	30	35	25
	UTILITY	29	29	140	89	29	21
SUBTOTAL		\$ 54	\$ 54	\$ 291	\$ 176	32%	22%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	6	10	35	35	34	24
	UTILITY	21	30	36	49	9	8
SUBTOTAL		\$ 27	\$ 40	\$ 71	\$ 84	17%	13%
BATCH	FUNCTION SPEC.	11	15	17	24	8	9
	INDUSTRY SPEC.	11	15	49	37	28	17
	UTILITY	36	40	40	46	2	7
SUBTOTAL		\$ 58	\$ 70	\$ 106	\$ 107	10%	8%
TOTAL PROCESSING	FUNCTION SPEC.	28	32	119	81	27	17
	INDUSTRY SPEC.	25	33	133	102	32	21
	UTILITY	86	99	216	184	16	11
TOTAL		\$139	\$164	\$ 468	\$ 367	22%	15%
SOFTWARE PRODUCTS	SYSTEMS	55	77	160	230	20	20
	APPLICATIONS	15	15	33	34	14	14
TOTAL		\$ 70	\$ 92	\$ 193	\$ 264	19%	19%
PROFESSIONAL SERVICES		169	330	400	863	15	17
GRAND TOTAL		\$ 378	\$586	\$1,061	\$1,494	18%	17%

O. SERVICES

- The most significant change in the services sector was the enlargement of the industry specific remote computing forecast.
 - This is shown in Exhibit C-23.
 - The revised forecast reflects purchases of on-line data base services that are much larger than previously estimated in such areas as accounting, credit, demographic, legal and news.
- Turnkey systems have not had the expected impact on function specific batch services, so the growth rate for the latter has now been raised.
- The growth rate for systems software products was reduced to reflect the large installed base of computers.

P. OTHER

- As shown in Exhibit C-24, the size of the industry specific remote computing market in the "other industry" sector was greatly increased, reflecting the user expenditures for real estate and other on-line data base services.
- The growth forecast for systems software products was reduced because this maturing market is now growing from a large base.

EXHIBIT C-23

RECONCILIATION OF COMPUTER SERVICES
FORECASTS IN SERVICES BETWEEN
1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE							
MODE	TYPE	1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$113	\$115	\$ 260	\$ 240	15%	13%
	INDUSTRY SPEC.	70	240	270	930	25	25
	UTILITY	41	50	160	190	25	25
SUBTOTAL		\$224	\$405	\$ 690	\$1,360	20%	22%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	-	5	-	13	-	17
	UTILITY	-	-	-	-	-	-
SUBTOTAL		-	\$ 5	-	\$ 13	-	17%
BATCH	FUNCTION SPEC.	53	50	120	140	15	19
	INDUSTRY SPEC.	146	145	230	235	8	9
	UTILITY	18	20	18	20	0	0
SUBTOTAL		\$217	\$215	\$ 368	\$ 395	9%	11%
TOTAL PROCESSING	FUNCTION SPEC.	166	165	380	380	15	15
	INDUSTRY SPEC.	216	390	500	1,178	14	21
	UTILITY	59	70	178	210	19	20
TOTAL		\$441	\$625	\$1,058	\$1,768	15%	19%
SOFTWARE PRODUCTS	SYSTEMS	16	25	92	125	34	30
	APPLICATIONS	28	29	110	115	26	26
TOTAL		\$ 44	\$ 54	\$ 202	\$ 240	29%	28%
PROFESSIONAL SERVICES		13	25	35	69	18	18
GRAND TOTAL		\$498	\$704	\$1,295	\$2,077	17%	20%

EXHIBIT C-24

RECONCILIATION OF COMPUTER SERVICES FORECASTS IN OTHER INDUSTRY SECTOR BETWEEN 1979 AND 1980 ANNUAL REPORTS

COMPUTER SERVICE		1979 FORECAST OF 1979 MARKET (\$ MILLION)	1980 REPORT OF 1979 MARKET (\$ MILLION)	1979 FORECAST OF 1984 EXTENDED FOR 1985 MARKET (\$ MILLION)	1980 FORECAST OF 1985 MARKET (\$ MILLION)	AAGR FORECAST IN 1979 REPORT (PERCENT)	AAGR FORECAST IN 1980 REPORT (PERCENT)
MODE	TYPE						
REMOTE COMPUTING SERVICES	FUNCTION SPEC.	\$ 39	\$ 40	\$ 110	\$ 105	19%	17%
	INDUSTRY SPEC.	27	140	92	450	23	21
	UTILITY	58	60	160	175	19	20
SUBTOTAL		\$124	\$240	\$ 362	\$ 730	20%	20%
FACILITIES MANAGEMENT	FUNCTION SPEC.	-	-	-	-	-	-
	INDUSTRY SPEC.	7	10	13	19	11	12
	UTILITY	4	5	13	10	11	11
SUBTOTAL		\$ 11	\$ 15	\$ 26	\$ 29	11%	11%
BATCH	FUNCTION SPEC.	75	80	150	180	12	15
	INDUSTRY SPEC.	86	94	180	210	14	14
	UTILITY	14	20	16	24	3	3
SUBTOTAL		\$175	\$194	\$ 346	\$ 414	12%	14%
TOTAL PROCESSING	FUNCTION SPEC.	114	120	260	285	15	16
	INDUSTRY SPEC.	120	244	285	679	16	19
	UTILITY	76	85	189	209	17	16
TOTAL		\$310	\$449	\$ 734	\$1,173	16%	17%
SOFTWARE PRODUCTS	SYSTEMS	19	19	230	120	51	35
	APPLICATIONS	27	26	140	125	31	30
TOTAL		\$ 46	\$ 45	\$ 370	\$ 245	41%	33%
PROFESSIONAL SERVICES		64	127	210	425	22	22
GRAND TOTAL		\$420	\$621	\$1,314	\$1,843	20%	21%

APPENDIX D: TOTAL PROCESSING SERVICES MARKETS,
BY MODE OF DELIVERY

APPENDIX D: TOTAL PROCESSING SERVICES MARKETS, BY MODE OF DELIVERY

- This appendix provides summary data on processing modes of delivery:
 - Remote computing.
 - Facilities management.
 - Batch.
- The data are also segmented by type of service within processing mode. The types of service are:
 - Industry specific.
 - Utility.
- Each exhibit contains industry data on all 14 industries INPUT tracks.
- Remote computing services (RCS) forecasts are detailed in Exhibits D-1 through D-3.
 - The total market forecast for RCS is shown in Exhibit D-1.
 - Industry specific RCS is forecast in Exhibit D-2.

EXHIBIT D-1

REMOTE COMPUTING SERVICES - TOTAL MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 432	\$ 535	24%	\$ 665	\$ 830	\$1,030	\$1,280	\$1,580	24%
PROCESS MANUFACTURING	290	360	24	445	560	690	860	1,070	24
TRANSPORTATION	80	96	20	115	140	170	200	240	20
UTILITIES	230	270	18	320	380	450	530	630	18
BANKING AND FINANCE	655	800	22	975	1,200	1,460	1,780	2,200	22
INSURANCE	155	185	18	215	255	300	360	425	18
MEDICAL	140	170	23	210	260	320	400	490	24
EDUCATION	48	53	10	56	62	67	73	80	9
RETAIL	310	375	21	450	550	670	810	990	21
WHOLESALE	154	180	18	215	255	300	355	425	19
FEDERAL GOVERNMENT	335	395	18	482	585	710	857	1,052	22
STATE AND LOCAL GOVERNMENT	54	66	22	81	99	120	145	176	22
SERVICES	405	495	22	600	740	905	1,100	1,360	22
OTHER	240	290	20	345	420	500	600	730	20
TOTAL	\$3,528	\$4,270	21%	\$5,174	\$6,336	\$7,692	\$9,350	\$11,448	22%

EXHIBIT D-2

REMOTE COMPUTING SERVICES - INDUSTRY SPECIFIC FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 246	\$ 315	28%	\$ 400	\$ 515	\$ 650	\$ 830	\$1,035	27%
PROCESS MANUFACTURING	35	43	22	52	64	78	95	120	23
TRANSPORTATION	40	50	25	63	80	100	125	155	25
UTILITIES	70	86	23	105	130	160	200	245	23
BANKING AND FINANCE	540	670	23	820	1,010	1,250	1,530	1,900	23
INSURANCE	70	85	21	100	125	150	180	220	21
MEDICAL	120	146	23	180	224	276	346	424	24
EDUCATION	8	9	11	10	11	12	14	15	11
RETAIL	250	301	21	361	440	535	646	788	21
WHOLESALE	80	96	20	115	140	170	200	245	21
FEDERAL GOVERNMENT	25	30	19	37	45	55	67	82	22
STATE AND LOCAL GOVERNMENT	8	10	25	13	16	19	24	30	25
SERVICES	240	300	25	375	475	590	740	930	25
OTHER	140	172	23	205	255	304	365	450	21
TOTAL	\$1,872	\$2,313	24%	\$2,836	\$3,530	\$4,349	\$5,362	\$6,639	23%

EXHIBIT D-3

REMOTE COMPUTING SERVICES - UTILITY FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 76	\$ 90	18%	\$ 105	\$ 125	\$ 150	\$ 175	\$ 210	18%
PROCESS MANUFACTURING	165	200	22	245	300	370	450	550	22
TRANSPORTATION	20	23	16	26	29	35	37	43	13
UTILITIES	100	112	12	125	140	160	180	200	12
BANKING AND FINANCE	45	51	13	57	66	74	84	95	13
INSURANCE	20	22	11	25	28	31	34	38	12
MEDICAL	7	8	19	10	12	14	17	20	20
EDUCATION	22	24	7	25	27	29	31	34	7
RETAIL	30	36	19	42	51	61	72	87	19
WHOLESALE	22	26	16	30	35	40	47	55	16
FEDERAL GOVERNMENT	220	260	19	325	400	490	600	750	24
STATE AND LOCAL GOVERNMENT	29	35	21	42	51	62	74	89	21
SERVICES	50	63	25	78	100	125	155	190	25
OTHER	60	71	19	85	100	120	145	175	20
TOTAL	\$866	\$1,021	18%	\$1,220	\$1,464	\$1,761	\$2,101	\$2,536	20%

- Utility RCS is forecast in Exhibit D-3.
- Facilities management (FM) processing services forecasts are shown in Exhibits D-4 through D-6.
 - The total FM market forecast is shown in Exhibit D-4.
 - Industry specific FM is forecast in Exhibit D-5.
 - Utility FM is forecast in Exhibit D-6.
- Batch services are forecast in Exhibits D-7 through D-9.
 - The total batch services market forecast is shown in Exhibit D-7.
 - Industry specific batch services are forecast in Exhibit D-8.
 - Utility batch services are forecast in Exhibit D-9.

EXHIBIT D-4

FACILITIES MANAGEMENT - TOTAL MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 60	\$ 71	18%	\$ 84	\$ 98	\$ 114	\$ 134	\$ 158	17%
PROCESS MANUFACTURING	40	47	18	55	64	76	89	105	17
TRANSPORTATION	30	33	11	37	41	46	51	57	12
UTILITIES	15	16	7	18	19	21	23	25	9
BANKING AND FINANCE	255	300	17	350	410	480	560	670	17
INSURANCE	428	480	13	550	620	700	800	910	14
MEDICAL	160	180	13	205	235	265	300	340	14
EDUCATION	20	23	17	27	32	38	44	52	18
RETAIL	15	18	18	21	25	29	35	41	18
WHOLESALE	40	46	15	51	58	65	73	83	13
FEDERAL GOVERNMENT	100	110	11	124	140	159	177	210	14
STATE AND LOCAL GOVERNMENT	40	45	13	51	58	65	73	84	13
SERVICES	5	6	17	7	8	9	11	13	17
OTHER	15	17	13	18	21	23	26	29	11
TOTAL	\$1,223	\$1,392	14%	\$1,598	\$1,829	\$2,090	\$2,396	\$2,777	15%

EXHIBIT D-5

**FACILITIES MANAGEMENT - INDUSTRY SPECIFIC MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985**

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 31	\$ 37	18%	\$ 44	\$ 52	\$ 61	\$ 72	\$ 86	18%
PROCESS MANUFACTURING	33	39	17	45	53	62	73	86	17
TRANSPORTATION	30	33	11	37	41	46	51	57	12
UTILITIES	2	2	0	2	2	2	2	2	0
BANKING AND FINANCE	255	300	17	350	410	480	560	670	17
INSURANCE	428	480	13	550	620	700	800	910	14
MEDICAL	160	180	13	205	235	265	300	340	14
EDUCATION	20	23	17	27	32	38	44	52	18
RETAIL	15	18	18	21	25	29	35	41	18
WHOLESALE	35	40	13	45	51	58	65	74	13
FEDERAL GOVERNMENT	-	-	-	-	-	-	-	-	-
STATE AND LOCAL GOVERNMENT	10	12	23	15	19	23	28	35	24
SERVICES	5	6	17	7	8	9	11	13	17
OTHER	10	11	11	12	14	15	17	19	12
TOTAL	\$1,034	\$1,181	14%	\$1,360	\$1,562	\$1,788	\$2,058	\$2,385	15%

EXHIBIT D-6

FACILITIES MANAGEMENT - UTILITY MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 24	\$ 28	17%	\$ 33	\$ 39	\$ 45	\$ 53	\$ 62	17%
PROCESS MANUFACTURING	5	6	19	7	8	10	12	14	18
TRANSPORTATION	-	-	-	-	-	-	-	-	-
UTILITIES	11	12	11	14	15	17	19	21	12
BANKING AND FINANCE	-	-	-	-	-	-	-	-	-
INSURANCE	-	-	-	-	-	-	-	-	-
MEDICAL	-	-	-	-	-	-	-	-	-
EDUCATION	-	-	-	-	-	-	-	-	-
RETAIL	-	-	-	-	-	-	-	-	-
WHOLESALE	5	6	10	6	7	7	8	9	8
FEDERAL GOVERNMENT	60	67	12	78	90	105	120	150	16
STATE AND LOCAL GOVERNMENT	30	33	9	36	39	42	45	49	8
SERVICES	-	-	-	-	-	-	-	-	-
OTHER	5	6	11	6	7	8	9	10	11
TOTAL	\$140	\$158	13%	\$180	\$205	\$234	\$266	\$315	15%

EXHIBIT D-7

**BATCH SERVICES - TOTAL MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985**

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 330	\$ 355	8%	\$ 382	\$ 417	\$ 446	\$ 481	\$ 522	8%
PROCESS MANUFACTURING	210	241	15	280	322	409	478	520	17
TRANSPORTATION	45	48	7	53	58	62	67	74	9
UTILITIES	60	62	3	66	69	73	76	81	5
BANKING AND FINANCE	590	630	7	687	744	800	857	929	8
INSURANCE	95	102	7	109	119	128	136	148	8
MEDICAL	155	168	8	176	191	205	221	237	7
EDUCATION	50	53	6	56	60	64	68	73	7
RETAIL	170	181	6	193	209	225	240	265	8
WHOLESALE	245	257	5	274	292	314	336	360	7
FEDERAL GOVERNMENT	57	57	0	57	58	58	58	58	0
STATE AND LOCAL GOVERNMENT	70	74	6	79	86	92	99	107	8
SERVICES	215	235	9	260	288	318	350	395	11
OTHER	194	219	13	251	282	318	363	414	14
TOTAL	\$2,486	\$2,682	8%	\$2,923	\$3,195	\$3,512	\$3,830	\$4,183	9%

EXHIBIT D-8

BATCH SERVICES - INDUSTRY SPECIFIC MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 60	\$ 66	11%	\$ 75	\$ 85	\$ 90	\$ 100	\$ 115	12%
PROCESS MANUFACTURING	100	122	22	150	180	255	270	335	22
TRANSPORTATION	20	22	11	25	28	31	34	38	12
UTILITIES	10	10	4	11	11	12	12	13	5
BANKING AND FINANCE	450	480	7	520	560	600	640	690	8
INSURANCE	65	70	8	76	83	90	95	105	8
MEDICAL	125	135	6	140	150	160	170	180	6
EDUCATION	20	22	9	24	26	28	31	34	9
RETAIL	85	88	3	90	95	95	100	105	4
WHOLESALE	50	50	0	50	50	50	50	50	0
FEDERAL GOVERNMENT	-	-	-	-	-	-	-	-	-
STATE AND LOCAL GOVERNMENT	15	17	16	20	24	27	32	37	17
SERVICES	145	155	8	170	185	200	215	235	9
OTHER	94	107	14	125	140	160	185	210	14
TOTAL	\$1,239	\$1,344	9%	\$1,476	\$1,617	\$1,798	\$1,934	\$2,147	10%

EXHIBIT D-9

BATCH SERVICES - UTILITY MARKET FORECAST
BY INDUSTRY SECTOR, 1980-1985

INDUSTRY SECTOR	MARKET FORECAST BY INDUSTRY SECTOR, 1980-1985								
	1979 (\$M)	1980 (\$M)	GROWTH 1979- 1980 (%)	1981 (\$M)	1982 (\$M)	1983 (\$M)	1984 (\$M)	1985 (\$M)	AAGR 1980- 1985 (%)
DISCRETE MANUFACTURING	\$ 60	\$ 64	6%	\$ 67	\$ 72	\$ 76	\$ 81	\$ 87	6%
PROCESS MANUFACTURING	45	46	3	48	50	51	53	55	4
TRANSPORTATION	10	10	0	10	10	10	10	10	0
UTILITIES	20	20	0	20	20	20	20	20	0
BANKING AND FINANCE	10	11	11	12	14	15	17	19	14
INSURANCE	10	10	6	11	12	13	14	14	5
MEDICAL	10	10	0	10	10	10	10	10	0
EDUCATION	15	15	0	15	15	15	15	15	0
RETAIL	30	30	0	30	30	30	30	30	0
WHOLESALE	95	97	2	99	102	104	106	110	3
FEDERAL GOVERNMENT	48	48	0	48	48	48	48	48	0
STATE AND LOCAL GOVERNMENT	40	41	2	42	43	44	45	46	2
SERVICES	20	20	0	20	20	20	20	20	0
OTHER	20	21	3	21	22	23	23	24	3
TOTAL	\$433	\$443	2%	\$453	\$468	\$479	\$492	\$508	3%

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APPENDIX E: COMPUTER SERVICES INDUSTRY
PERFORMANCE, 1970-1980

APPENDIX E: COMPUTER SERVICES INDUSTRY PERFORMANCE, 1970-1980

- Clients have requested a ten year historical perspective on the computer services industry. Exhibits E-1 and E-2 were prepared in response to these requests.
- The historical perspectives have been produced using the following methodology:
 - 1980 data has been reconciled with INPUT's first 1976 market assessment, then extrapolated from 1976 back to 1970.
 - Data for each year has been made compatible with current definitions of computer services type and mode of delivery.
 - Each year's data has been adjusted backwards based on:
 - Knowledge of the computer services industry market today.
 - Knowledge of previous years' markets.
- In 1976 INPUT first estimated a base of \$5.4 billion for the computer services industry; this was subsequently adjusted to a base of \$7.6 billion. The five-year growth rate originally forecasted was 16% per year through 1981, compared to a four-year experienced growth rate of 17%.

EXHIBIT E-1

COMPUTER SERVICES INDUSTRY
PERFORMANCE SUMMARY, 1970-1980

COMPUTER SERVICE	COMPUTER SERVICES MARKET		
	1970 (\$ MILLION)	1980 (\$ MILLION)	1970-1980 AAGR (PERCENT)
PROCESSING SERVICES			
RCS	\$ 540	\$ 4,270	23%
BATCH	1,060	2,682	10
FM	390	1,392	14
TOTAL	\$1,990	\$8,344	16%
SOFTWARE PRODUCTS			
SYSTEMS	150	1,521	26
APPLICATIONS	100	883	24
TOTAL	\$ 250	\$2,404	25%
PROFESSIONAL SERVICES	930	3,422	14
GRAND TOTAL	\$3,170	\$14,170	16%

EXHIBIT E-2

COMPUTER SERVICES INDUSTRY YEARLY PERFORMANCE, 1970-1980

COMPUTER SERVICE	(\$ MILLION)										
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
PROCESSING SERVICES RCS	\$ 540	\$ 670	\$ 840	\$1,030	\$1,260	\$1,560	\$1,980	\$ 2,390	\$2,940	\$ 3,528	\$4,270
BATCH	1,060	1,170	1,290	1,410	1,560	1,710	1,880	2,020	2,300	2,486	2,682
FM	390	450	510	590	670	770	880	1,030	1,230	1,223	1,392
TOTAL PROCESSING	\$1,990	\$2,290	\$2,640	\$3,030	\$3,490	\$4,040	\$4,740	\$ 5,440	\$6,470	\$ 7,237	\$8,344
SOFTWARE PRODUCTS											
SYSTEMS	150	210	270	330	390	490	590	720	890	1,152	1,521
APPLICATIONS	100	140	170	210	270	320	390	480	590	720	883
PROFESSIONAL SERVICES	930	1,070	1,190	1,340	1,500	1,690	1,910	2,160	2,480	2,932	3,422
TOTAL	\$3,170	\$3,710	\$4,270	\$4,910	\$5,650	\$6,540	\$7,630	\$8,800	\$10,430	\$12,041	\$14,170

APPENDIX F: RELATED INPUT REPORTS

APPENDIX F: RELATED INPUT REPORTS

1977-1980 MARKET ANALYSIS SERVICE (MAS) REPORTS

ANNUAL REPORTS

	<u>Year</u>
● Computer Services Industry 1979 Annual Report	1979
● Computer Services Industry 1978 Annual Report	1978
● Computer Services Industry 1977 Annual Report	1977
● Computer Services Industry 1976 Annual Report	1976

MAS REPORTS

1980 MAS REPORTS

- Computer Services Markets For Insurance Agents And Brokers
- Market Opportunities For Data Base Services
- Marketing Application Software, 1980-1985

- Trends In Computer Services Pricing
- Trends In Modes Of Delivery Of Remote Computing Services
- Improving Sales Productivity In The Computer Services Industry
- Strategic Market Planning In The Information Processing Industry

1979 MAS REPORTS

- Sales And Sales Support Training
- Computer Services Markets In Banking And Finance
- Opportunities In Education Services
- Opportunities In Marketing Systems Software Products
- Computer Services Opportunities In Insurance Companies
- Computer Services Opportunities In Government Funded Health Insurance
- Office Of The Future: Opportunities For Services Companies
- Turnkey Systems Opportunities, 1979-1984

1978 MAS REPORTS

- Acquisition Strategies For Computer Services Companies
- Financial Management And Planning Services And Software Markets
- Opportunities In User Site Hardware Services

- Distributed Data Processing Systems: Applications, Performance And Architecture
- Trends In Services And Software Pricing
- Computer Services Markets In Hospitals
- Data Base Management Systems Software Markets
- Remote Computing Services Markets In Europe
- Computer Services In Federal Government Energy Programs

1977 MAS REPORTS

- Computer Services Markets In Correspondent Banking
- Small Business Computers: Their Impact On Processing Services
- Plug Compatible Mainframes: The New Hardware Economics
- Impact Of Sales Compensation Plans In The Computer Services Industry
- Computer Services Markets For The Savings And Loan Industry
- Computer Services Markets In The Wholesale Industry - Petroleum, Petrochemical, Food And Electrical/Electronic
- Computer Services Markets In The Discrete Manufacturing Industry
- Opportunities For Investment In The Computer Services Industry
- Remote Computing Services Markets Based On Data Base Management Systems

1976 MAS REPORTS

- EDP Plans And Budgets For 1977
- Computer Services Markets In The Services Industries. Part I - Accountants, Lawyers, Consultants
- Computer Services Markets In The Services Industries. Part II-Architects, Engineers, Research & Development
- Remote Computing Services Markets For Economic And Financial Data Bases
- Computer Services Markets In The Food Processing Industry
- Economics Of Computer/Communications Networks And Their Future Impact
- Assessment Of Amdahl As A Viable Alternative To IBM
- Computer Services Markets In The Petroleum Industry
- Computer Services Markets In Government Funded Health Insurance

1980 MULTICLIENT STUDIES

PUBLICATION
DATE

- Strategy For Competing In The IBM
Compatible Marketplace 2/80

- Services Opportunities In Distributed Data Processing, 1980-1984 3/80
- The Market For Personal Computers In Large Corporations 10/80
- Productivity Improvement, 1980-1983, Survival Strategies For EDP Executives 12/80
- Opportunities In Communications Services For Digital Information: A Study Of User Networks And Needs 11/80

OTHER INPUT SUBSCRIPTION PROGRAMS

- Company Analysis And Monitoring Program For The Computer Services Industry
- Field Service Planning Information Program
- Planning Service For Computer And Communications Users
- Residual Value Forecasting Service
- Vendor Watch Service

